JPRS-UST-84-010

24 April 1984

USSR Report

SCIENCE AND TECHNOLOGY POLICY

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS-UST-84-010

24 April 1984

USSR REPORT

SCIENCE AND TECHNOLOGY POLICY

CONTENTS

BSSR OFFICIAL ON RAISING PRODUCTION EFFICIENCY, QUALITY

Minsk PROMYSHLENNOST' BELORUSSII in Russian No 12, Dec 83 pp 39-42

[Report on interview with Al'bert Ivanovich Fedorovich, chief of the Administration for Planning Scientific Research Work and Introduction of Scientific and Technical Achievements in Production and member of the Collegium of the BSSR Gosplan, by correspondent V. Tarasevich, in the column "The Union of Science and Production": "In the Main Direction"; date and place not specified]

> [Text] All possible ensurance of the rapid pace of development of scientific and technical progress is a decisive condition for raising the efficiency of social production and improving production quality. This position was stressed once again in the resolution of the CPSU Central Committee and the USSR Council of Ministers "On Measures for Accelerating Scientific and Technical Progress in the National Economy." Our correspondent V. Tarasevich has met with Al'bert Ivanovich Fedorovich, chief of the Administration for Planning Scientific Research Work and Introduction of Scientific and Technical Achievements in Production and member of the Collegium of the BSSR Gosplan, and asked him to comment on this document of paramount importance.

"The resolution provides for further improvement in the management of scientific and technical progress," A. I. Fedorovich noted. "Work in this direction is being constantly conducted in our country. Suffice it to recall, for example, the most important measures which were implemented in accordance with the course developed by the 25th and 26th party congresses toward intensification of social production. The changeover of scientific research, design and planning-technological organizations and industrial enterprises to a cost accounting work organization system in developing, mastering and introducing new technology was completed. This system, first of all, aims scientists and specialists toward raising the technical level of production.

"The special programmed planning method has gained broad dissemination in solving most important scientific and technical problems. Forecasting of scientific and technical progress has become a basis for long-range planning of the country's economic and social development. The question is about a comprehensive program, planned for 20 years.

"The scale of utilization of scientific and technical achievements has grown considerably. At the same time, organizat'on of this work still does not correspond in full measure to the task set by the party of linking in practice the advantages of our social system with achievements of the scientific and technical revolution. The question is about more fuller use of scientific possibilities, essential improvement of quality and competitiveness of the most important kinds of industrial production, the necessity of increasing labor productivity and reducing expenditures of materials and energy in production and some other problems.

"It is in this connection that the resolution of the CPSU Central Commitee and the USSR Council of Ministers "On Measures for Accelerating Scientific and Technical Progress in the National Economy" was adopted. To ensure the most reasonable use of the production and scientific and technical potential and to develop a system of organizational, economic and moral measures which would gain the interest of supervisors, workers, scientists and designers in renewing technology--this is the task advanced by the party. An action program was confirmed, which provides for the output of production that corresponds to the best contemporary samples, introduction of progressive manufacturing processes and substantial raising on this bases of labor productivity in the national economy.

"It was established that fulfillment of plans and tasks for developing science and technology is included among the most important indicators, which are used, first of all, to appraise the results of economic activity of associations and enterprises and to sum up the results of socialist competition. Demands for quality are being increased. Certification of industrial production in two categories of quality--highest and first--will be introduced beginning in 1984. Articles which are not certified according to these categories are subject to removal from production.

"The advantages of the special programmed approach to solving most important scientific and technical problems have already been proven in practice. The republic has 50 comprehensive scientific and technical programs on most important problems in force, including 7 special programs and is fulfilling the tasks of 108 union programs. By implementing them it is expected that the economic effect will be more than R300 million already this year, more than 34,000 people will be conditionally released and 90 percent of the increase in labor productivity will be ensured by introducing measures of scientific and technical progress.

"During the current five-year plan, such programs will be implemented in republics, sectors, regions and territorial and production complexes. It is planned to include the basic tasks of these programs in 5-year and annual plans, and resources for their implementation will be allocated in the first instance.

"Responsible tasks have been s t before scientific research organizations. They are faced with achieving improvement in the results of research work and in ensuring active participation by scientists in introducing their results in production. Ministries and departments must strengthen all links which are connected with developing and introducing new technology--from the training of

scientists and specialists and accelerated construction and technical equipping of testing and experimental bases and production facilities to establishing reserves of capacities for finishing and mastering the output of progressive kinds of equipment and materials. It is intended to use more broadly the advantages of the closest links to production, which are formed in associations and enterprises of provisional scientific and production subdivisions. There are also plans to organize similar subdivisions to solve intersectorial tasks. Thereby conditions are established for overcoming barriers between science and production and between various departments as well.

"'We are faced with enormous work in developing machines, mechanisms and technologies for today as well as for tomorrow,' said Yu. V. Andropov at the June plenum of the CPSU Central Committee. The resolution of the CPSU Central Committee and the USSR Council of Ministers opens broad prospects for all possible acceleration in the pace of scientific and technical progress."

[Question] The resolution devotes special attention to strengthening economic and moral stimuli in renewing equipment and technology and in training scientists and specialists. Will you please describe what is being done in this direction in our republic?

[Answer] It is well known that slow introduction of new equipment, materials and manufacturing methods in production was explained to a great extent by shortcomings in the existing economic incentive system. It is directed mainly at ensuring basic production. But development and introduction of new equipment is being insufficiently stimulated. The amount of bonuses received by workers of associations and enterprises for using scientific and technical achievements was only about 2 percent of the overall amount of awards paid for overfulfilling planned production tasks.

It must be noted that the changeover of scientific research institutes [NII], design buros [KB] and industrial enterprises to a cost accounting system in developing and introducing new equipment and formation in this connection in ministries and departments of a unified science and technology development fund has created favorable conditions for stimulating such work. Currently all industrial ministries are able to set up sufficient economic incentive funds for developing and mastering new equipment. Unfortunately, this ability is not always being used to the full. The new demands to quality and technical level of production, especially of machine tools and machines, which are set forth in the resolution, will undoubtedly make ministries and departments review their attitude toward unified scientific and technical development funds.

Incentive allowances (up to 30 percent) to wholesale prices for new highly efficient production will be established as well as discounts (up to 30 percent) from wholesale prices for industrial production which is subject to removal from production. Henceforth, bonuses to supervisors of enterprises will be reduced by at least 25 percent for frustrating tasks of the scientific and technological development plan.

I would like to emphasize that the quality of production is ensured through combined efforts of science and production. However, principal questions with

regard to improving quality in the broad sense of the word, that is output of more improved production as regards its technical and economic indicators and consumer characteristics, are solved in scientific research institutes and design buros. In this connection the resolution aims at further raising the effectiveness of scientific potential, at continuing work in improving the network and structure of scientific institutions and design-technological organizations and at using new progressive methods in organizing their work. The press has already reported on the experiment as regards wages in design buros of Leningrad, which is also another element in stimulating more efficient work. Undoubtedly, the positive experience of the experiment will also be taken into consideration in our republic.

Of course, one of the basic factors in developing new types of equipment and manufacturing methods are personnel and their professional and qualification level. We are conducting extensive work in training scientific personnel. There are 39,000 scientific workers in the republic today. Among them 2.2 percent are doctors and 30 percent candidates of sciences. More than 3,000 people take postgraduate course in 47 scientific institutions and 21 VUZs. Belorussia has been given an opportunity to send nearly 100 specialists on special purpose assignments annually to major scientific research institutes and VUZs in the country.

It is very important that supervisors of organizations and enterprises would realize the importance of this work and would concern themselves with improving skills of personnel in a genuine manner. It is particularly necessary because there are not enough doctors and candidates of sciences in some sectorial scientific institutions and design buros of union and republic jurisdiction. There are also not enough of them at large industrial enterprises, which essentially are modern scientific and production complexes and are in need of highly educated specialists.

The questions of training scientific personnel are constantly in the center of attention of party organs and the government of the republic. An interdepartmental council for training and certification of personnel is in operation at the BSSR Gosplan to develop effective ways in organizing this work.

[Question] Improvement in planning work of scientific and production associations is an urgent, topical question. The BSSR is among three republics where such planning will be conducted in a new way. What does this mean in practice?

[Answer] Centralization of scientific and technical activity in sectors of the national economy is being consistenly carried out in our republic. The organic link of scientific, design and production subdivisions is ensured by the creation of scientific and production associations headed by scientific subdivisions. At present there are 15 such associations in operation, including 4 in republic and 6 in union-republic ministries. The results of activity of individual scientific and production associations [NPO] have proven their high efficiency and the possibility of considerably reducing the periods in developing and introducing new equipment.

The structure of scientific and production associations provides for conducting scientific research, developing experimental designs on the basis of research, finishing them in experimental production and producing experimental batches of machines, mechanisms and devices with their subsequent turnover to industrial enterprises for mastering series production.

For the purpose of accelerating implementation of research and development results of institutes of the BSSR Academy of Sciences and VUZs a course has been taken on establishing the country's first specialized intersectorial scientific and production associations. The republic scientific and production association of powder metallurgy marked the beginning of this. A process is underway of converting some institutes of the BSSR Academy of Sciences into complex scientific institutions. Some of them, for example, the Metal Polymers Systems of Mechanics Institute and the Physical Technical Institute were converted into academic scientific and technical complexes, which are capable of carrying out a completed work cycle in developing new equipment.

Broad dissemination has also been gained by new organizational forms of unity of science and production--educational, scientific and production and scientific and production associations on voluntary service principle. At present, 41 associations are operating in our republic with the participation of VUZs, scientific associations of the BSSR Academy of Sciences, sectorial scientific research and planning and design organizations, production associations and industrial enterprises.

The establishment of associations has promoted further concentration of efforts of highly skilled specialists of scientific institutions and VUZs in solving most important tasks facing sectors of the national economy and assisted in providing scientific collectives with a production base for finishing developed technological processes, new kinds of equipment, devices, materials and so forth, in raising the theoretical level of plant workers and in improving the training of specialists in VUZs in accordance with production requirements.

At the same time, experimental production facilities of associations are quite often loaded with series production, which has a negative effect on the periods of finishing and mastering newly developed samples. Thus, experimental production facilities of the Belbyttekhnika Scientific and Production Association of BSSR Ministry of Consumer Services and the Progress Scientific and Production Association of the BSSR Ministry of Local Industry are basically engaged in the output of ordinary series production, which undoubtedly slows down the development of new equipment.

An experiment in converting individual scientific and production associations, including in our republic, to planning according to the "science and scientific service" sector with exclusion of tasks for overall volume of production from the list of confirmed indicators is called upon to eliminate these discrepancies.

[Question] The resoltuion says that one of the main directions for acclerating scientific and technical progress [NTP] is broad automation of technological

processes. Development of special programs for creating automated planning systems was also provided for. How do you, Al'bert Ivanovich, appraise the rate of automation of these processes? What are the prospects?

[Answer] The decisions of the 26th CPSU Congress and some of the subsequent plenums of the Party Central Committee devote special attention to raising the rate of mechanization and automation of production. It must be said that in our republic this work is being conducted quite successfully. At present, more 1,500 automatic lines, nearly 8,000 mechanized flow lines and 800 automated and comprehensively automated shops and sectors are operating in its national economy. During the years of the 11th Five-Year Plan alone, nearly 3,000 units of automatic equipment and more than 600 robots and robot-technical complexes were introduced.

However, the share of manual labor still remains unjustifiably high--almost one third of those working in industry and nearly one half in construction. This is why the resolution provides for additional measures aimed at accelerating the rate of production automation on the basis of flexible automated production systems, including automated planning systems.

The basic reserve for raising production efficiency at present consists in developing integrated planning systems with simultaneous conducting of technological preparation of production facilities and subsequent manufacturing of components and units at flexible automated production facilities. Such work is already underway in the republic. Programs for introducing integrated systems at Minsk enterprises of the radio engineering sector (1981-85) have been confirmed.

This work will be broadly developed in machine building and other sectors in the near future. Also envisaged is development of a directed comprehensive program for developing and introducing in 1986-90 at enterprises in the republic of flexible automated production facilities and integrated systems. In reality this means conversion to a completely automated production, which requires an exceptionally high skill of service personnel. Specialists of today must understand mechanics, electronics and technological processes that are characteristic of one or another sector. Bearing in mind the acute need in such specialists, a department of robot engineering and special courses for further training of engineers and technicians were opened at the Belorussian Polytechnical Institute. At the same time, the Ministry of Higher and Secondary Specialized Education, the State Committee for Vocational and Technical Education, the BSSR Academy of Sciences and ministries and departments must organize training and further training of specialists for developing and servicing the aforementioned production facilities and planning systems, having in mind organization of special faculties and departments in higher educational institutions and sections and groups in technical schools and vocational and technical schools. Corresponding changes should be made in the list of skills and educational programs of institutes for raising qualifications of personnel.

[Question] The interests of the consumer are placed in the forefront in planning production and developing new equipment. Will you please describe what measures are being taken in order to consider the standpoint of consumers more fully and to ensure a high technical level of new equipment?

[Answer] The new equipment placed in production must correspond to best world achievements and be competitive in the world market. Our republic has the highest indicators in the country as regards production of highest category of quality. This year, R6 billion worth of such goods will be produced (the reltive share in commodity production will be more than 23 percent). High quality indicators were achieved by the Minsk Refrigerator Plant, the Orsha Krasnyy Borets Machine Tool Buildin, Plant and the Minsk Motorcycle and Bicycle Plant.

New types of domestic refrigerators, transistor radio receivers and furniture have been produced. The variety of sewn and knitted goods is renewed annually by 50-60 percent and of footwear by 80 percent.

At the same time, it must be noted that in the past few years the relative share of goods of highest category of quality has not increased in practice. Some types of goods do not correspond as regards their technical and economic indicators to the best domestic and foreign analogues. The technical level of cameras, watches and some other consumer goods has been rising slowly.

Machine building is the most important sector, which ensures scientific and technical progress of the entire economy. Unfortunately, in 1981 our republic turned out 24.7 percent of machine building production, which was placed in production 10 and more years ago, and only 6 percent of production which was mastered in the same year.

This problem has become a subject of a deep analysis by party and planning organs of the republic. As a result, measures have been worked out for raising the technical level and quality of production and tasks have been established for improving the technical parameters of the most important types of articles. The task is as follows: to ensure by the end of 1985 the output of 30 percent of commodity production with the state mark of quality.

The combination of measures, which are aimed at ensuring output of high quality production and more fuller consideration of consumer views, will be implemented in accordance with the resoltuion of the CPSU Central Committee and the USSR Council of Ministers. For the purpose of raising the role of consumers of production in working out plans for developing and producing new equipment, it was established that ministries and departments--the leading ones for types of production--must develop and confirm in coordination with ministries--the basic consumers--the long-term range and systems of machines, equipment and other technology. Ministries and departments--the leading ones for types of machine building production--were assigned to develop jointly with customer ministries differentiated norms of their renewal periods. The State Committee on Prices [Goskomtsen] is given the right to establish incentive allowances to wholesale prices for new highly efficient production and discounts for goods subject to removal from production. For the purpose of raising the material incentive of participants in developing and mastering highly efficient equipment, technology and new materials, as of 1985 one-time bonuses are to be introduced by the ministries and departments of the USSR and council of ministries of union republics in the amounts from R3,000 to R40,000. All of these measures, undoubtedly, will make it possible to considerably raise the technical level and quality of production.

The resolution of the CPSU Central Committee and the USSR Council of Ministries is a new manifestation of party and government concern for raising efficiency in the use of creative reserves in our country's economy. This is another stage along the path of implementing the decisions of the November (1982) and the June (1983) plenums of the CPSU Central Committee on cardinal raising of labor productivity on the basis of broad introduction of scientific achievements, technology and leading experience.

9817
CSO: 1814/75

NEED TO INTEGRATE SCIENCE AND PRODUCTION STRESSED

Minsk KOMMUNIST BELORUSSI in Russian No 12, Dec 83 pp 2-9

[Editorial: "The Integration of Science and Production--A Demand of the Times"]

[Text] The third year of the five-year plan is ending, and we can note with pride our new economic successes. Throughout the country as a whole the rate of growth in national production and labor productivity increased more than during the first two years. In fulfilling the decisions of the 26th CPSU Congress and the November and May (1982) and June (1983) Plenums of the CPSU Central Committee, the workers of our republic have also achieved certain successes in national economic construction: the rate of growth in industrial production and labor productivity has risen and the state has received a larger volume of agricultural products than in the previous year.

There have been positive changes and the goal is not only to consolidate what has been achieved, but also to give our forward movement a new impulse, having developed means and methods of economic construction and management that correspond to today's conditions. Comrade Yu. V. Andropov, general secretary of the CPSU Central Committee, pointed out in his article "The Teachings of Karl Marx and Several Questions Involving Socialist Construction in the USSR" that "We need to take a sober view of where we are. Running ahead means setting some unrealizable goals; dwelling only on what has been achieved means that we fail to utilize everything that is at our disposal. What we need to do now is to see our society in its actual dynamic state, with all its possibilities and needs."

At every stage of our development the foundation of the CPSU's foreign and domestic policies has been a Marxist-Leninist analysis of specific circumstances, an ability to identify the key problems at a given moment and to concentrate the efforts of communists and all of our people on resolving these problems. Today as well the party has once again clearly defined what we need most urgently and what is most important: a cardinal increase in labor productivity and all-round intensification of the economy by making maximum use of the achievements of scientific and technical progress. This is the only way to guarantee accelerated development of production, a rise in the people's standard of living, and to strengthen the defensive capability of our Homeland in the current international situation, which happens to be the most complicated of the entire post-war period.

The application of results of scientific work and advanced technical thinking in the national economy is growing steadily. The decree issued by the CPSU Central Committee and the USSR Council of Ministers "On Measures to Accelerate Scientific and Technical Progress in the National Economy" notes that "the organization of this work in the country still does not correspond completely to the goal set by the party for the practical unification of the advantages of our socialist system and the achievements of the scientific and technical revolution." The decree also points out the special urgency of this problem, in light of the fact that the development of science and technology has become one of the main directions in the competition between the two social and economic systems.

In Belorussia there are all the prerequisites for successful resolution of this most important national economic problem. The research done in the republic in a number of fields of mathematics, physics, materials research, nuclear power engineering, biology, technical, and other applied sciences, is well known throughout this country and abroad. A 20-year republic-wide comprehensive program for scientific and technical progress and its social and economic consequences has been worked out. The growing national economic significance of the work being done is evidenced by the fact that the practical application of results obtained by scientific institutions of the BeSSR Academy of Sciences between 1981-1983 brought a significantly greater economic effect than during the entire previous five-year plan. This was also aided by further strengthening of the institutions' working ties not only with major enterprises in the republic, but also with a large number of leading USSR ministries. Many achievements in engineering are distinguished by a high level of perfection. One proof of this is the presentation of the 1983 USSR State Prize to a large group of the republic's industrial workers for creation and practical introduction of automatic production lines and complexes.

Speaking at a recent session of the general meeting of the BeSSR Academy of Sciences, comrade N. N. Slyun'kov, first secretary of the CPBe Central Committee, identified several key directions in the scientific quest, which "could be called a social requirement for our scientific personnel," taking into account the urgent demands of the republic's economy.

One of these directions is extensive automation of technological processes based on application of automated machine tools, machinery and mechanisms, standardized equipment modules, robot engineering complexes and computer technology.

This problem is by no means just a technical or production problem. The crucial character of the current national economic situation lies in the fact that up until now the changes in the social, economic, and production conditions of labor have been the result of technical progress. At the same time, developed socialism, developing on its own foundation can and should be determined according to a plan; we would like to achieve this as a result of scientific and technical progress, we should adhere to the same type of planning in order to achieve the desired goals. Our society now has the possibility of deliberately forming the nature of its technology, proceeding primarily from the demands of social and economic effectiveness.

For the most successful resolution of this task, the CPSU Central Committee and the USSR Council of Ministers recognized the need to expand the application of special program planning in the development of science and technology. In Belorussia this work has been going on for five years already. In the 11th Five-Year 50 republic-wide programs have been put into action, the fulfillment of which is directed by specialized coordinating and problem councils.

In spite of the fact that only three years have passed, important results have already been obtained under a number of programs that are, as a rule, of a long-range nature. For example, the development and introduction of new materials based on polymers and combining them with other types of raw materials, timber in particular, is being carried out successfully. These materials are used in place of metal in various assemblies and mechanisms and increase the life of the machinery and equipment by a factor of 1.5-2. The fulfillment of this work, with specialists from the BeSSR Academy of Sciences, a number of plants, industrial institutes, and the BeSSR Ministry of Agriculture particpating, will make it possible to improve the technological properties involved in manufacturing tractors and fodder-harvesting combines, and to reduce the metal consumption of products and expenditures on their operation. It has been estimated that the use of every 400-500 tons of new materials will save the national economy 1-1.5 million rubles. The Construction and Architecture Institute of the BeSSR State Committee for Construction Affairs and the Geochemistry and Geophysics Institute of the BeSSR Academy of Sciences have made significant advances in fulfilling the goals of the program that includes important problems tied to the construction of the Minsk Metro and improvement of sanitary and hygienic conditions along its route.

There a quite a few examples of this type. At the same time, it is no secret that the goals of a number of programs are not being met or are being met only partially. Another factor here is that in questions involving the acceleration of scientific and technical progress and improving the management of the economy, we sometimes employ "the highly irrational trial and error method," to use comrade Yu. V. Andropov's words. In a number of cases issues have been included in programs that are beyond the authority and sphere of influence of republic organizations, as a result of which these goals have not been included in the sectors' preliminary plans. There is another possibility: the republic program calls for a certain group to perform the tasks at a certain stage, while the sectorial program calls for another group. This is what happened, for instance, with problems tied to creating a standardized family of large trucks, trailer trucks, automation of tractors, and so forth.

The republic's ministries and departments are not exhibiting much activity in meeting various goals. For example, on the whole work is being carried out successfully under the program being coordinated by the BeSSR State Committee for Construction Affairs, which calls for introduction of automated thermal treatment and a number of other effective innovations in manufacturing prefabricated reinforced concrete. At the same time, the BeSSR Ministry of Housing and Municipal Services and the Belorussian Inter-Kolkhoz Construction Organization are doing a poor job of performing the work in the sectors that have been assigned to them.

Today the party and the government are posing the question of special programmed planning of scientific and technical progress in a new manner. The range of republic programs is changing somewhat and regional programs are being introduced. Enterprises and organizations located for the most part within a region, and when necessary, outside of a given region, participate in meeting the program goals. The appropriate goals, allocation of means and funds, quotas, and so forth, will be included in the state plans for the country, sector, and republic.

The large amount of work that has been done in this direction in Belorussia can be viewed as necessary preparations for making the transition to methods which will make it possible not only to identify weak areas and errors, but also to gain some positive experience. For instance, the joint developments of the "Integral" Association and VUZ's in Minsk accounted both for sectorial demands and the main directions of scientists' work, which made it possible to create an actual prototype of the regional programs that will be put into effect in the 12th Five-Year Plan.

At the contemporary stage the most important direction for applying scientific forces is maximum participation in realization of the Food Program. The republic's scientists are working on a wide range of problems, from developing new, highly productive varieties of grain, potatoes, and other crops, to designing effective methods for storing agricultural products. For example, the Belorussian Potato, Fruit, and Vegetable Breeding Scientific Research Institute, in conjunction with scientists from the BeSSR Academy of Sciences, created and successfully tested a new method for protecting potatoes from mold during winter storage. It has been estimated that application of this method on a republic-wide basis will make it possible to save 50 million rubles annually. Scientists are working actively now on the synthesis of fodder substances using by-products of agricultural production and industry, on raising the technical level, reliability, and durability of agricultural equipment, and so on.

With the aim of directing the republic's scientific potential toward resolving the fundamental and applied tasks of the Food Program, and strengthening creative ties between institutions of the BeSSR Ministry of Agriculture and western departments of the Academy of Agricultural Sciences imeni V. I. Lenin, an interdepartmental council was created under the BeSSR Academy of Sciences to deal with problems in agricultural science. Its first activities have already demonstrated the long-range prospects for this form of cooperation, which makes it possible to outline specific ways to meet the goals set down in the Food Program.

One of this ways is suggested in the decree issued by the CPSU Central Committee and the USSR Council of Ministers "On Measures to Accelerate Scientific and Technical Progress," which discusses the expediency of creating temporary creative collectives that unite specialists in different fields for the effective resolution of pressing scientific and practical problems. It is evident that the time has come to create subdivisions of this type for several agricultural problems that cannot be fully resolved within the framework of just one department. Examples of problems of this nature are biological fixation of nitrogen, the development of effective methods for reproducing soil fertility,

the creation of mineral fertilizers with extended period of effectiveness, among others.

Another pressing problem that has been pointed out by the party is increasing the effectiveness of engineering work, automation of planning and other operations that precede direct production output. Scientists and specialists from the BeSSR Academy of Sciences, a number of industrial scientific research institutes, VUZ's and enterprises in the republic are working fruitfully on creating and utilizing automated systems for planning and for making technological preparations for production. They are working at the "Minsk Tractor Plant imeni V. I. Lenin" Association, the "BeloavtoMAZ" [Belorussian Motor Vehicle Plant] Association, the Automatic Lines Association, the "Gomsel'mash" [Gomel Agricultural Machinery] Association, the "Gorizont" [Horizon] Association, and others.

Without a doubt, all of this is important and useful, but the time has come to move from isolated "breakthroughs into the future" to a mass attack along the entire front, to creating integrated systems that include automated planning, technological preparations for production, and direct manufacturing of products, and not only in machine building, as has been the case in the past.

The application of scientific and technical achievements should also have a fundamental effect on improving product quality, especially since starting in 1984 there will be certification for only two quality grades--highest quality and first quality.

The problem of product quality is not simple. On the one hand, resolution of this problem depends on raising the technical level of the products themselves as well as production technology. The Bureau of the CPBe Central Committee approved the work that has been done in this area by the party organization at the Minsk Electrical Engineering Plant imeni V. I. Kozlov. Utilizing progressive design and technological solutions, and close party control over their implementation, workers here managed to create new product models that are distinguished by lower consumption of materials and improved parameters. This makes it possible to save the national economy a significant amount of electrical power and petroleum products that are in short supply.

On the other hand, guaranteeing a high level of quality is also a moral issue. In one of his speeches, M. I. Kalinin told of how Bolshevik workers, still underground, discussed the question: is it necessary to be concerned about product quality if it benefits the factory owner? They came to the conclusion that there is a need to be concerned about quality, since poor work lowers the dignity of a man of labor. M. I. Kalinin said: "And here, in our socialist society, when we work not for the capitalists but for ourselves, doesn't it harm everyone, isn't everyone ashamed to do poor work?"

Unfortunately, this is not always the case. Therefore, the CPBe Central Committee has instructed oblast, city, and rayon party committees, executive committees of local Councils of People's Deputies, and trade union and Komsomol organs to reinforce their organizational and political work that is aimed at improving product quality, developing in workers a sense of responsibility for

the honor of the factory and plant label, and for bringing their products into line with the best models.

It is well understood, however, that accelerating scientific and technical progress, including progress that involves improving product quality, is a task that belongs not only to the scientists. True, there is nothing more practical for the success of this work than solid, sound theory. But today the slogan "Science should be oriented toward production" can and should be supplemented more and more by another: "Production should be oriented toward science." After all, the position of practical workers often determines the success or failure of transferring laboratory achievements into plant shops.

The Novopolotsk "Polimir" [Polymer] Association is engaged in active cooperation with science and it is helping science develop innovations that are important not only for the enterprise, but also for the entire national economy. When academic scientists and specialists from the Novopolotsk Polytechnical Institute suggested testing an effective inhibitor that would reduce the rate of metal corrosion to one-fourth to one-fifth the average rate (and consequently increase the life of industrial equipment, the "Polimir" Association not only introduced the new preparation into its production processes in a very short period of time, it also set up production of the preparation itself. Today this corrosion retardant is being used successfully in the country's oil and gas industries.

There are quite a few more examples of this nature, but unfortunately, there are still instances when a useful innovation runs into stubborn opposition, only because workers in related industries or the national economy as a whole, will be benefiting from the implementation of the innovation, and whoever is first to incorporate a new development will certainly be faced with additional concerns. Here we encounter not only technical and economic problems, but also human and moral issues that involve principles, conscientiousness, and a party approach to the matter at hand.

A simple and original method for strengthening large forging dies was offered to the Special Instrument and Technological Accessories Plant, which is part of the "Minsk Tractor Plant imeni V. I. Lenin" Association; the method was treated as an invention and the plant was to incorporate this method. Tests had already confirmed that this was a highly effective method: the stability of the dies increased on the average by a factor of two. This means that the presses need to be stopped less often to replace the instrument, that is, productivity rises and the quality of the products manufactured is improved. And that is certainly beneficial. This has also been confirmed by the experience at the "Gomsel'mash" Association, where the application of this process proposed by scientists from the Belorussian Polytechnical Institute resulted in an annual economic effect of 45,000 rubles. Another factor also became evident: if the stability of the dies increases, the tractor plant's use of the dies drops, and this reduces the load of the enterprises manufacturing the dies, and its indicators decline. The Special Instrument and Technological Accessories Plant worked out a very simple way to eliminate this situation: a freeze on the introduction of new developments. It was only the energetic intervention on the part of the association's party committee that forced the plant's managers to reconsider their position.

In his speech at the November (1982) Plenum of the CPSU Central Committee, comrade Yu. V. Andropov clearly defined the sources of phenomena of this nature: "...in order to introduce a new method, a new technology, one needs to reorganize production in one way or another, and this has an effect on plan fulfillment. There may be questions about failure to fulfill a production plan, but poor incorporation of new technology should really be the primary focus of criticism."

From now on the fulfillment of quotas for developing science and technology will be included among the most important indicators for evaluating the results of enterprises' economic management activities. This means that not only economic managers, but also "party, soviet, and trade union organs need to make fundamental improvements in all the work they do to accelerate scientific and technical progress."

Problems involving the practical utilization of scientific and technical achievements were the focus of communists' attention during the course of many election meetings of primary party organizations and rayon and city party election conferences; and they are being included on the agendas of meetings of the party's economic management members. This broad discussion of the problems once again confirms that success is achieved most often when party committees and organizations devote constant attention to the issues.

The Orsha city party committee is doing a great deal of fruitful work in this area. Under its guidance, party committees at enterprises are doing a great deal to make the maximum and most efficient use of scientific and technical innovations in production. Thanks to the purposeful party leadership, the city's enterprises are stepping up production output mainly by increasing labor productivity. Throughout the city as a whole in 1982 this indicator was 97 percent, and for the first 10 months of this year, it reached a full 100 percent. Industrial enterprises in Baranovichi, Bobruysk, Vitebsk, and Novopolotsk achieved similar high indicators under the guidance of their cities' party organizations.

Unfortunately, the situation is not the same everywhere else. At enterprises in Pinsk, for example, there is still a high proportion of manual labor, and what's more, it is even growing in ancillary production. A commission has been created in the city for coordinating and monitoring the fulfillment of programs tied to reducing manual labor, but it performed its functions so poorly that every fifth enterprise, and the town as a whole, failed to fulfill the goals in this sphere. In spite of this, the state of affairs has not undergone a fundamental review on the part of the city party committee and party organizations at the enterprises that are lagging behind. As a result, over a 10-month period only 47.8 percent of the increase in production in the city was due to a rise in labor productivity. Industry in the town of Mozyr had absolutely no increase in production output that was due to this factor. The city party committee and its industrial departments have an incomprehensibly relaxed attitude toward the fact that at a number of enterprises there is a drop in the capital-output ratio and the wages are rising more rapidly than output.

Once again we hear the argument that cities such as Pinsk and Mozyr do not have their own scientific institutions and major planning, design, and technological

organizations, as if to justify the situation. The town of Bobruysk does not have any either, but it managed to increase it production output solely by increasing labor productivity.

Party committees and organizations play a huge and invaluable role in questions tied to activating people's life position and creative potential. For instance, the party committee at the Minsk Motor Plant responded with interest and attention to the initiative put forward by the collective of the office of feeding systems and fuel apparatus under the chief designer's department at the enterprise. In spite of the fact that it is difficult to say anything new in diesel engine building, since world science and technology have been engaged in the field since the last century, specialists in the office decided to make each new development of invention caliber and to see that it meets the standard of being among the latest scientific and technical achievements. They also resolved to provide an annual economic effect from these developments that exceeded the offices wage fund by a factor of 5. Over 10 years the collective was awarded 53 patents for its inventions, with about 20 patents in the United States, England, France, Italy, Japan, and other countries. They exceeded their goal of saving the sum of their wage fund 5-fold. This experience has now become a rule for all the major design bureaus at Minsk motor building plants to follow.

There is a huge army of thinking people operating in the republic; more than a half-million workers, engineers, and technicians are united by scientific and technical societies. With the active participation of organizations under scientific and technical societies, energy-saving equipment and technology is being introduced successfully. Many enterprises now have volunteer boards of experts to review the technical level of production and technological processes. The results of their work are used in replacing and modernizing equipment, in drafting plans for the reconstruction of shops and sections, and in writing up enterprise passports that outline the advancing parameters of production.

We could cite dozens of examples of this nature. High over-all indicators sometimes lead to a sense of complacency, and to glossing over shortcomings. It is no secret that the metal consumption of various types of machinery and equipment is still very high, and the coefficient of utilizing rolled metal is quite low. This means that thousands of measures suggested by activists of scientific and technical societies are not reaching their goals.

There are thousands of rationalizers and inventors in Belorussia and they are distinguished by their great creative potential. Throughout the republic and beyond its borders the names and deeds of honored rationalizers of the BeSSR are well known, such as A. Bartashevich, R. Zholtka, I. Zabavchik, L. Potapovich, E. Radkevich, A. Usov, and many other innovators. Technical creative work and a desire to make a personal contribution to improving production have become internal needs of many thousands of people. One of these people is Valentin Sergeyevich Shakhnov, winner of the 1983 USSR State Prize and leader of a brigade of lathe operators at the chief enterprise of the "Stromavtolininya" [Construction Materials Automated Production Line] Association. An active innovator himself and a leader in production, he heads the plant's council of brigade leaders. With the transition to the brigade form of organizing labor and wages, the communist Shakhnov became concerned with questions involving

technical improvements in production not only in his own section, but throughout the plant as a whole. It is also to Valentin Sergeyevich's credit that the Mogilev workers produce the best, primarily automated equipment for the construction materials industry, and that the first robots and machine tools with programmed control appeared in their shops.

The republic's rationalizers and inventors promised to save a total of 1 billion rubles during the five-year plan, and over the first 2 years they already saved half this sum. In the third year, however, the pace has slowed down somewhat. For instance, the innovation work is dropping off throughout the entire system of the BeSSR Ministry of Light Industry and the BeSSR Ministry of the Construction Materials Industry. There has even been a marked decline in the number of rationalizers and inventors. Unfortunately, the party bureaus and committees of the ministries themselves and of the organizations subordinate to the ministries are not making the necessary demands on the services that are supposed to provide the appropriate conditions for maximum development of innovation activities. This is not the first year that there has been a decline in the indicators of creative activity.

A decree issued by the CPSU Central Committee and the USSR Council of Ministers calls for strengthening the base of scientific, planning, and design organizations and VUZ'S. In this very area, however, the state of affairs is far from favorable. During the first 2 years of the five-year plan, the plan for construction and installation work just on projects of the BeSSR Academy of Sciences was met by 80 percent, and during the first 10 months of this year, it was met by 60 percent. It seems that this fact should be a topic for serious discussion at the party organization of the BeSSR Ministry of the Construction Materials Industry, and at party organizations of the associations and trusts involved in the construction of projects for scientific use.

Party committees and organizations need to participate more actively in supporting the organization of cooperation between science and production and improving the forms of their integration. The fact is that often years are spent on moving scientific and technical solutions from the laboratory to the shop. More often than not this is a result not so much of a conservative attitude and distrust of the new, but of poorly organized cooperation.

Our republic initiated the creation of a new form for integrating science and production: educational-scientific-production associations that join VUZ's and plants. These associations were meant to help resolve a number of tasks set by the party in accelerating scientific and technical progress.

Today within the system of the BeSSR Ministry of Higher and Secondary Specialized Education alone there are over 40 of these associations; unfortunately, though, there is a growing trend toward a decline in the level of their work. Party committees and rectorates of VUZ's sometimes perform tasks that are mere formalities: the association is formed on paper, and the planned sum of the expected economic effect is obtained. Furthermore, the work of some educational-scientific-production associations deals with trivial topics, and there is a digression from the original principles behind these associations. Economic agreements are sometimes based not on the actual resources of VUZ science, but on patching numerous "current holes" in one area of production or

another. But work according to the principle "a greater number at a lower price" has nothing in common with goals for accelerating scientific and technical progress.

Today it is becoming more and more clear that in our epoch production is tied objectively and inseparably to progress in knowledge; and science in turn is merging with production. Only the fullest utilization of the possibilities offered by this interaction, and all-round scientific, technical, organizational, ideological, and political support for its development and strengthening will make it possible for us to meet as fully as possible the goal set by the party: to unite in practice the advantages of our socialist system and the achievements of the scientific and technical revolution.

9967
CSO: 1814/76

ACHIEVEMENTS, PLANS OF ANGOM ASSOCIATION DESCRIBED

Minsk PROMYSHLENNOST' BELORUSSII in Russian No 12, Dec 83 pp 43-45

[Article by V. Gol'dade, scientific secretary of the ANGOM Council, and V. Yakovlev: "ANGOM: Time of Maturity"]

> [Text] The cooperation of the BSSR Academy of Sciences with industrial enterprises of Gomel has a long history. It is no mere chance. The remoteness of the city from "great" science (for example, more than 85 percent of academic scientific and technical potential of the republic and a greater part of sectorial science is concentrated in Minsk) and the needs of industry of a large industrial region, such as Gomel, have brought about the establishment here of its own scientific center.

In May 1977, when the "Days of Science" were held in Gomel, an original form of scientific and technical cooperation was born--sponsorship by institutions of the Physical and Technical Sciences Department of the BSSR Academy of Sciences of Gomel industrial enterprises (the ANGOM Scientific and Production Association). The partners have agreed to coordinate collaboration in solving current scientific and technical problems and in organizing accelerated introduction of the obtained results in production. Participating actively in this work from the first days are the Gidroprivod [not further identified], starting engines and plastic goods plants. By 1981, the number of enterprises collaborating within the framework of the ANGOM has reached 13. Among them now are the Gomel Agricultural Machine Building Production Association [Gomsel'mash], the Gomel Woodworking Production Association [Gomel'drev], the machine tools building plant imeni S. M. Kirov and other enterprises.

During the 1977-80 period, the ANGOM association conducted work according to 14 subjects, united in two large sections: development of progressive technological processes and designing, testing and reliability of devices and machines. The overall volume of economic contractual work carried out at that time by institutions of the Physical and Technical Department of the BSSR Academy of Sciences already exceeded R300,000. Some research was conducted according to agreements on creative cooperation and three subjects were fulfilled by a laboratory under dual jurisdiction. Cooperating within the framework of association with institutes of the BSSR Academy of Sciences were the Gomel Agricultural Machine Building Production Association, the Gidroavtomatika [not further identified] Production Association, the starting engines plant and the secondary raw materials processing plant. As a result

of introduction of developments by academic institutes at these enterprises, the real economic effect has reached R3 million in 4 years. Taking into account other city enterprises that actively use the research results (the Gomel Woodworking Production Association, the machine tools building plant imeni S. M. Kirov, the chemical plant and the plastic goods plant), the economic effect has exceeded R5 million.

Already back in the 10th Five-Year Plan results were obtained whose significance transcends the framework of the oblast and even an individual sector. Thus, collaboration of the Gomel Agricultural Machine Building Association with the Metal Polymers Systems of Mechanics Institute (IMMS), the Machine Reliability and Durability Institute (INDMASH) and the Applied Physics Institute (IPF) has ended in the use of new materials in the units of the KSK-100 combine and development of original testing equipment. The starting engines plant has obtained an economic effect of R800,000 from introduction of plastic components and units, which were developed at the Metal Polymers Systems of Mechanics Institute. Joint development by the Gidroavtomatika Production Association, the Physical Technical Institute (FTI) and the Metal Polymers Systems of Mechanics Institute of the BSSR Academy of Sciences in raising service life and reliability of coaxial piston pumps was awarded the BSSR state prize in the field of science and technology.

Of no lesser importance was another result: during this period, experience was accumulated in working together and scientists and production workers became really intimate and found a common language. In this, perhaps, is the main social effect of interaction of science with production.

In the 11th Five-Year Plan, work is being conducted according to 16 subjects within the framework of the ANGOM association, with an anticipated economic effect of R2.5 million. The subjects of research have also been expanded. They particularly include the economizing of metals and replacing them with cheaper and lighter materials, restoring waste to production as secondary raw materials, raising equipment reliability and automating engineering labor and technological processes.

A seminar for supervisors of Gomel enterprises was conducted in the early part of the five-year plan to familiarize them with completed scientific developments of institutes of the BSSR Academy of Sciences. Over a period of several days the guests familiarized themselves with the developments of the Physical Technical Institute and the Technical Cybernetics, the Heat and Mass Transfer and the Machine Reliability and Durability Institutes. The meeting was interesting and useful not only for Gomel residents alone. As a result, new scientific ideas were born whose implementation would make it easier to solve the tasks linked to economizing power and labor resources and raising labor productivity.

The pace of practical work in the current five-year plan and the unsolved problems of the association in 1983 were discussed at a conference of the ANGOM council, participating in whose work were leading scientists of physical technica orientation, including P, Yashcheritsyn and V. Chachin, academicians of the BSSR Academy of Sciences, I. Tsitovich, corresponding member

of the BSSR Academy of Sciences, and specialists of physical and chemical profile. The real economic effect of cooperation of institutes of the BSSR Academy of Sciences with 13 Gomel enterprises in 2 years alone has exceeded the goal planned for the end of the five-year plan (R2.5 million). This is a good indicator. At the same time, new tasks have appeared which require rapid solution. Some of them (for example, the problems of conserving secondary resources and materials, lowering metal content in industrial equipment and reducing manual labor) can be handled by the "flagships" of our physical technical science, who have been working within the ANGOM framework for a long time. Other problems (for example, such as developing new control systems for metalworking machine tools with numerical programmed control) require, it seems, the drawing of experience and scientific and technical potential of institutes of electronics and technical cybernetics.

At present the basic part of ANGOM's work is handled by the Gomel Agricultural Machine Building Production Association. In 1982, a directed program was formed within the framework of the association on solving scientific and technical problems arising before the combine builders. Besides institutes of the Physical Technical Sciences Department, several other scientific institutions of the BSSR Academy of Sciences have joined this work. Currently, 10 institutes are participating in fulfilling the planned program. Also formulated was the Kombayn [Combine] regional scientific and technical program, the basic part of work in which is being fulfilled by the Gomel Polytechnical Institute. Interaction of scientists and specialists of the association was exceptionally useful. All participants in the interaction--from the general director to ordinary workers--were imbued with the idea of scientific and technical progress (not merely in words but with deeds). Literally within a year, chief specialists of the enterprise have changed from formulating minor tasks at an innovation level to propounding and solving major long-range problems.

Thus, the Machine Reliability and Durability Institute is conducting research of fodder combine axles, introducing methods of accelerated stand testing of units in speed up condition and planning to introduce an automated system of laboratory-bench testing with the use of control electronic computers. The Technical Cybernetics Institute of the BSSR Academy of Sciences was assigned to develop a packet of applied programs for designing shafts and bearings and to work out a design procedure of conditions and standardization of processes in welding components and assembly units. All of this will make it possible to reduce the time in designing articles and in developing manufacturing processes by a factor of 5 to 8 as well as to reduce the expenditures on these operations by a factor of 2 to 3.

The Metal Polymers Systems of Mechanics Institute of the BSSR Academy of Sciences is faced with fulfilling a large volume of reasearch in reducing the weight and labor intensiveness in manufacturing units of fodder harvesting equipment by using composite materials. Introduction of new polymer and wood and polymer components in the designs of combines and industrial equipment and development of wear-resistant coatings and linings on the cutting elements of a combine will make it possible to reduce the expenditure of metal to 200 kg per one machine and to reduce the labor intensiveness in manufacturing units by 30-40 percent.

The Heat and Mass Transfer, Applied Physics and Electronics Institutes plan to devote themselves to questions of using secondary energy resources, raising the durability and wear-resistance of tools and improving production quality. Specific tasks on protecting the environment from industrial waste materials were set before the Physics, Physical Organic Chemistry and General and Inorganic Chemistry Institutes.

What are the initial results? Associates of the General and Inorganic Chemistry Institute have introduced in the grey iron shop of the Gomel Agricultural Machine Building Production Association new antiburn additives to molding sand mixtures on the basis of used up lubricants-coolants. Fulfillment of the entire outlined program will make it possible for scientists to make a substantial contribution to the building of 50,000 KSK-100 combines. It is precisely this much new equipment that the collective of the Gomel Agricultural Machine Building Production Association has pledged to produce for the rural workers in the current five-year plan.

The main task at present is deepening cooperation and integrating problems that are being solved jointly. As noted at the conference of the ANGOM Council by P. Yashcheritsyn, academician of the BSSR Academy of Sciences, it is necessary to develop more the long-term directions of work. Let us take for example the problem such as the development of flexible automated production facilities. Experience proves that many robots which are orientated toward any single operation soon become unecessary owing to changes in manufacturing methods. Robots must be convertible and serve a long time in the composition of various lines.

The partners will also have to intensify contacts in the technological fields. Sectors, which could manufacture experimental samples, should be established at enterprises. There is also a need for plant science sectors for coordinating work, which could become a reliable linking unit. Such sectors could ensure plants with information on completed scientific developments and scientists with knowledge as regards urgent production problems. In short, there is much work ahead of partners in the ANGOM association. The accumulated experience in cooperation instills confidence that further contacts will be even more fruitful and will serve more active development and strengthening of the oblast's industrial potential at a much higher scientific and technical level.

Powder metallurgy is a relatively new branch of science. However, it possibilities have already been appraised in production. It makes it possible to use metal practically without losses and sharply simplifies the manufacturing methods by reducing the number of operations from 20-40 to 4-6. According to estimates by scientists, the changeover of production from ordinary manufacturing methods to powder metallurgy methods will save R175,000 on every 100 t of ferrous metal components and R220,000 on nonferrous metal componnents. At the same time, up to 290 t of rolled metal or casting will be saved and an average of 25 persons and 8 metal-cutting machine tools will be released. Moreover, the powder metallurgy makes it possible to obtain man-made materials which considerably surpass natural materials as regards their properties.

The work performed by the collective of the Belorussian Republic Scientific and Production Association of Powder Metallurgy makes implementation of these advant ıges in practice possible. The friction and antifriction materials, depth filters and methods for obtaining components by means of cold plastic deformation, explosion welding and so forth which were developed here are known throughout the country.

The collective of the association is expanding the fields of practical use of progressive scientific and technical developments. An experimental production facility is in operation here, and powder metallurgy sectors have been established at some enterprises in the country with the assistance of scientists of the scientific and production association. Currently, the association is making preparations for commissioning the first stage of the Molodechno plant which will produce components made of metal powders.

9817
CSO: 1814/75

PLACE OF MANAGEMENT IN THE ECONOMIC SYSTEM

Vilnius KOMMUNIST in Russian No 11, Nov 83 pp 39-47

[Article by Prof V. Baranauskas, doctor of economic sciences]

[Text] The productive forces of the USSR, their scientific-technological and industrial potential are growing at an exceptionally high speed in the second half of this century, carrying into effect the advantages of socialism and achievements of the scientific and technological revolution. The industry of scientific-technological progress (machine building and metal working, chemical and electric power industries) disposes of half the fixed production capital of industry. An analogous level of development of productive forces has already been reached also in Lithuanian SSR.

With the achievement of such a high level of development of productive forces, one can and must build up production of physical assets only by means of its intensification, i.e., by raising its efficiency on the basis of scientific and technological progress, rather than by extensive development and increasing the number of workers.

Under conditions of mature socialism, intensification of production, growth in production of the most needed high-grade physical assets per unit of production resources means the following:

> Comprehensive advanced training of individuals working in production (basic produtive force), increasing their creative and production activities, development of socially necessary intensity of labor and strengthening of discipline; need for better support of labor with the latest and most efficient equipment, use of progressive technology and economic, wise use of all physical resources, production means, which make it possible to make increasing use of natural forces in the work process, on the basis of the latest advances of science and technology, instead of human energy; refinement of the entire economic system, i.e., socialist unification of the work force and means of production, social organization of production, science and scientific services, management and planning, economic ties, cost accounting and socialist competition.

In a speech at the November (1982) Plenum of the CPSU Central Committee, comrade Yu. V. Andropov stated that our economy is too slow in moving to the track of intensive development and demanded that "...work be accelerated to improve the entire area of administration of the economy--management, planning and the economic mechanism."

The direction to be followed to achieve these goals is indicated in the decisions of the 26th CPSU Congress, as well as the decree of the CPSU Central Committee and USSR Council of Ministers dated 12 July 1979, "Improvement of Planning and Intensification of Influence of the Economic Mechanism to Improve Effectiveness of Production and Quality of Work."

The economic mechanism [system], like any other, has its own system of management. It provides for interaction of all components, elements, links, operating agencies of the system, enables it to function in accordance with its purpose. There is a two-way relationship between the mechanism and its system of management. But even the most "perfect" management system cannot transform a poor mechanism into a good one and, on the other hand, a good mechanism will not be beneficial if there is a poor system of management.

Scientific and technological progress, intensification of production and improvement of its efficiency are being restrained to an enormous extent by flaws in social separation of labor, deeper specialization of labor, on the one hand, and insufficiently effective integration of specialized, narrowly separated labor into the orderly organism of an enterprise, scientific production, sectorial, intersectorial or territorial complex. For this reason, effective improvement of organization of production, its scientific servicing and management constitutes one of the most important and pressing directions in the matter of augmenting the role of management in the economic mechanism.

K. Marx had already stated that "in a major industry, man is learning to make the product of his prior, already embodied labor perform free of charge on a large scale, like the forces of nature" (K. Marx, "Das Kapital," Moscow, Vol 1, 1949, p 394). In our country, 4877 kilowatt-hours of electricity was consumed (produced) per capita in 1980 (which is 20 times more than in 1940). This is equivalent to the labor of 24 workers for 1 year, and 17 workers in this republic. But as yet not all reserves have been utilized. For there are 16 countries in the world that produce and consume more electricity per capita than in our country. In order to establish the organizational conditions to make use of equipment on a broader scale, it is necessary, in the words of V. I. Lenin, "to increase the productivity of human labor directed, for example, toward manufacturing some small part of a product; it is necessary for the production of this small part to become specialized, a special industry dealing with the product on a mass scale and, for this reason, allowing (and causing) for the use of machines," while specialization of national labor "is infinite in its very essence, just like the development of technology" (V. I. Lenin, "Complete Works," Vol 1, p 95).

One of the most important functions of the system of management of the economic mechanism is expressly to master this process. Unfortunately, it is expressly the most efficient forms of technological and detailed specialization and particularly ancillary industrial production are developed the least,

both in industry and agriculture (and, by analogy, other sectors of physical production). The main cost-accounting links of industry (enterprises, production associations, sovkhozes, kolkhozes, etc.) have acquired the most varied production services and social self-services, which divert an enormous portion of production resources that are then used inefficiently because of being dispersed.

Here is just one example. Before 1966, the number of foundries was reduced to 11 in our republic for the purpose of concentration, specialization, cooperation and, on this basis, combined mechanization and automation of complicated foundry work that was deleterious to health. The ministries of the concerned sectors took the tack of expanding self-services, generating small and inefficient foundries, but those that were "their own," instead of continuing this process and finalizing work to upgrade the scientific and technological standards in the iron works industry. In 1980, there were already 38 such foundries in our republic, including 11 small ones producing less than 1000 tons of cast iron per year. That same year, about 38,000 tons of cast iron was transported out of the republic (55 percent of the special cast iron produced at the Kaunas Tsentrolitas [foundry]), while over 21,000 tons of cast iron was brought in from other economic regions (Yerevan, Leningrad, Moscow, Kolomna and others). About 3000 tons of cast iron was delivered from enterprises belonging to the USSR Ministry of the Electrical engineering Industry, although they were far away from our republic, to the Kaunas Electra Plant, situated in the vicinity of Tsentrolitas, between which there is not only the Nyamunas River, but departmental barriers that are difficult to surmount. The same year, the import and export turnover of cast steel in the republic constituted 500 and 3330 tons, respectively.

"Overgrowth" of each enterprise with various ancillary services is the consequence of bureaucracy, localistic tendencies and unreliable production ties and, if it can be so expressed, resignation of economists from the need to upgrade organization of social production, deepen separation of labor, specialize it, as well as reliably cooperate and integrate, providing the conditions for technological progress. It is imperative to upgrade product and, particularly, part-related technological specialization of production, introduce on a broader scale flow-line methods of mechanized and automated production, organize the brigade system of labor, strengthen the scientific-engineering departments and reduce to a minimum the number of elements in production management, following the example of progressive ministries of industry, associations, enterprises, territorial complexes and cities (Volga Motor Vehicle Plant, Leningrad Optical Mechanics Association and others). In our republic, most has been done in this regard at the Sigma Production Association, but this should be considered merely the beginning of a large job.

There is the particularly acute and complicated problem of linking development of science and industry, as well as their integration on different levels of management. The advantage of a large enterprise, particularly a production association, is that a concentrated enterprise offers greater opportunities for efficient utilization of equipment, progressive methods of organizing production, developing and making wise use of its own scientific-technological potential, as well as services of scientific-technological organizations in the sector or educational establishments.

This republic's ministries of industry have at their disposal more or less developed specialized organizations engaged in scientific research, planning, designing, as well as technological and experimental services. It is necessary to augment in every way their role in intensifying sectorial production, since problems of renewal of products, complex mechanization of production, introduction of progressive technology, measures aimed at improving organization of production, labor and management require, in most cases, a centralized solution on the level of the sector, rather than an individual enterprise.

It is expressly the ministries of industry, with the help of the above-mentioned organizations, that must work out orders for academic scientific-technological, as well as specialized sectorial organizations (of both the republic and the nation), for scientific divisions of VUZ's. They are called upon to establish permanent and regular ties with scientific institutions, especially since the latter are expected to strengthen ties with industry, in accordance with the decree published in the press in November 1982 of the Central Committee of the Communist Party of Lithuania and this republic's council of ministers, "Improvement of efficacy of scientific research and augmenting the role of science in the matter of accelerating scientific and technological progress of the national economy in the light of the decisions of the 26th CPSU Congress."

Scientific institutions of our republic have a great shortage with respect to an experimental planning and design base. For these purposes, there should be broader and more regular use of planning and design organizations of industrial ministries, as well as the experimental capabilities offered by base enterprises. In 1978, 32 base production enterprises were attached to 24 scientific research departments of Vilnius State University, Kaunas Polytechnic Institute and Vilnius Construction Engineering Institute for the purpose of experimental and production tests. The department of chemistry of polymers at Vilnius State University, in collaboration with the Scientific Research Institute of Thermal Insulation, the Litbytkhim [Lithuanian Household Chemicals] Assocation and Dvarchenskiy Building Materials Combine, have developed and assimilated production of new, special resin-binding substances, use of which yields an economic gain of 600,000 rubles per year.

A number of base enterprises have changed into bases for student practice, professional collaboration of VUZ scientists and production specialists, following through into practice dissertations and places for organizing scientific and practical conferences. Several scientific production complexes and scientific-educational-production associations are operating well on a voluntary basis. Comprehensive reinforcement and better utilization of the experimental production base, expansion of ties between sectorial planning and design offices, on the one hand, and scientific institutions and industry, on the other, would strengthen the weak point in the "science-engineering-production-consumption" cycle, making this cycle more systematic and shorter.

It is necessary to establish and expand production, as well as scientific production associations in industrial sectors and subsectors under Union subordination (machine building, household chemicals, microbiology, etc.), wherever specialization of production and scientific-technological organizations of the republic coincides. The first steps in this direction have already been taken. Recently, the Litstankoproyekt [Lithuanian Machine Tool Planning]

Scientific Production Association (LSP) was established, which includes an institute (formerly the Vilnius branch of the All-Union State Institute of Planning and planning-design office of mechanization and automation of the All-Union Commercial Association of Technological Outfitting) and Vilnius Technological Outfitting Plant. The main function of the LSP is to service machine-tool building plants in the republic with regard to preparation and implementation of complex plans for construction, remodeling, technology, mechanization and automation.

The Machine Tool Production Association imeni F. E. Dzerzhinskiy was established on the basis of three Kaunas machine tool plants. However, the Vilnius branch of the Experimental Institute of Metal-Cutting Machines, its experimental plant and territorial computer center, four machine tool plants in Vilnius and one in Shyaulyay, three plants manufacturing products for general sectorial use (Tsentrolitas in Kaunas, the Industrial Holder and Fastener Plant and Shilute Hydraulic Drive Plant) each functioned independently. The merger of this specialized, territorially compact production and scientific potential, management of a single organization and its activities in the form of a scientific production or production association would help the nation in finding faster solutions to problems of development and production of precision machine tools.

The second direction in the matter of augmenting the role of management in the economic mechanism is to refine planning and cost accounting, the two main factors in the economic system and, chiefly, to improve their interaction. In order to have planning perform effectively the role of the principal lever of the entire economic machinery, that would mobilize and guide the efforts of all participants of social production, it is imperative for cost accounting, which is the basic method of planned socialist management, to also proceed in the same direction on all levels of management. When the economy is switched to the road of intensive development, it is necessary to refine the carrying out of the basic principles of cost accounting: to have industrial enterprises and associations pay for themselves (sale of products must make a profit), efficient economic independence (the right to dispose of allocated production resources as they see fit, to solve economic problems), physical responsibility and interest in the results of labor, financial control of economic activity.

New socioeconomic and sociopolitical conditions in order to solve the problems set forth by the 26th CPSU Congress and the nation's Food Program, for comprehensive intensification of production on the basis of management of the economy in a new way, with resourcefulness and total responsibility were provided by the decrees adopted at the May and November (1982), as well as June (1983) plenums of the CPSU Central Committee and subsequent decrees of the CPSU Central Committee and USSR Council of Ministers ("Additional steps to expand the rights of production associations (enterprises) of industry in planning and economic work and intensification of their responsibility for results of work," "Refinement of economic correlations between agriculture and other sectors of the national economy," "Measures to accelerate scientific and technological progress in the national economy" and others), the decrees of the CPSU Central Committee, USSR Council of Ministers and AUCCTU,"On strengthening socialist work discipline," the law "On worker groups and increasing their role in management of enterprises, institutions and organizations." At the

June (1983) Plenum of the CPSU Central Committee, comrade Yu. V. Andropov observed that "the task is to develop a system of organizational, economic and spiritual steps that would interest both administrators and workers, and of course scientists and designers in renovating technology and would make it disadvantageous to work the old way."

The most profound and complicated problem that has not yet been entirely solved by economic science and management practice is to define the criterion of cost-accounting effectiveness of production and close dependence of physical incentives for the production group on the ultimate results of cost-accounting work.

In solving this problem, one must constantly bear the following in mind: dependence of physical incentives on fulfillment and overfulfillment of plans leads to a situation where the production team is interested in having an "easier" plan, in not revealing its internal reserves, not outlining major, "risky" measures aimed at upgrading production and the product itself, although in the future this would, no doubt, be beneficial to both the enterprise and the entire national economy. This contradiction is also aggravated in view of the fact that the influence of structural changes in production on resource and quality indicators is often disregarded or not assessed systematically and objectively enough in planning practice. As a result, the faster development of progressive production worsens cost-accounting production indicators.

Use of the indicator of standard-net production (SNP) would lower somewhat the negative effect of new products on average cost-accounting indicators of enterprises (productivity of labor, profitability, etc.); however, it would by no means eliminate it (use of the SNP indicator alone cannot solve this problem). In the 5-year period of operation of wholesale prices in a dynamic industry it is usually possible to lower significantly the cost of products and, accordingly, increase output. Yet, with the start of production of a new type of product one has to begin at the level of standard or even lower indicators. This often explains the paradox where assimilation of new products leads to worsening of cost-accounting indicators of an enterprise.

The criterion of cost-accounting effectiveness of production, the indicators used to evaluate it, planned assignments and cost-accounting incentives must compel each basic cost-accounting element of production, sectorial and territorial production complex to satisfy entirely (or as fully as possible) the needs of society in the products they manufacture (work they perform), assure their high quality and level of economic effectiveness on a par with the best domestic and foreign achievements, or exceeding the average level of a related product. For this purpose, it is necessary to dispose of the needed technical and economic information on each level about the relevant production achievements, progressive knowhow in our country and abroad, as well as scientifically validated norms and standards of manpower resources, supplies of raw materials, materiel, fuel, power and financial resources, production capacities, equipment, specific capital investments that would permit better validation of long-term and current plans, improve their balance, disclose more deeply and utilize more fully the production reserves. This area is still very deficient in the practical work of enterprises, associations,

ministries and planning agencies. Expressly the achievement of high scientific-technical and economic levels and retention of such levels must be the most important objects of economic incentives, while the dynamics of these indicators should determine to a large extent the differentiation in wages.

For this reason, in control of the economic mechanism, the most important task is to provide for an organic link between planning and price-setting, which stimulates accelerated production, renewal and improvement of quality of the most effective and needed products. The forms of wages and economic incentives, level of wages must be closely linked with the final planning and actual indicators of effectiveness of production, degree of satisfaction of needs for the product. It is necessary to make coordinated use of financial and credit incentives, as well as material and technical support. For this reason, the levels of the economic system (planning, organization of scientific and technological progress, material and technical supply and sales, organization of labor and wages, cost setting, finances and credit, etc.) should function synchronously and smoothly on all levels of management. In the main cost-accounting element of production, there must be systematic implementation of the basic principle of socialism, "from each according to his abilities, to each according to his work."

In order to achieve greater synchrony in the operation of many management bodies in implementing the above principle at virtually all levels of management, one must organize social production more effectively, as well as its scientific and technical servicing, planning and control, from the standpoint of the sector and territorial principle. This applies in particular to the very low competence, responsibility and opportunities afforded to Union republics and economic territorial complexes, where the existing ways and means of management are not always effective enough, particularly in solving such problems as dynamic development and efficient use of the social infrastructure, integration of science and industry.

With the change to the road of intensive development, the role of these factors grows immensely. In the last two decades (1960-1980), the part of the population working in sectors of the industrial infrastructure (transport, communications, trade, etc.) has grown from 9.3 to 13.8 percent, as compared to the total number of workers in our republic, i.e., by 1.5 times, whereas in sectors of the social infrastructure (education, science, scientific servicing, art, public health, municipal and consumer services, personal services, management system, etc.), it rose from 13.5 to 24.5 percent, i.e., by 1.8 times.

The existence of some lag in development of this area from the average national indicators is a large reserve for scientific-technological, economic and social progress in our republic. Here is but one example: The territory of our republic is one-sixth the size of Japan, while the population is 1/33d. Yet in Japan, there are 120 times more telephones. By increasing the number of phones by four times, one could intensify significantly social production, save time in everyday life and better organize one's leisure hours.

The third direction for augmenting the role of management is to increase the communistic consciousness of participants in social production, strengthen discipline, encourage their participation in planning, management and organization of production, in improving the effectiveness of socialist competitions.

If genuine effectiveness is not provided for organization of production, its scientific servicing and control, planning and cost accounting, the development and implementation of special-target programs to solve the most important scientific and technological problems becomes limited to some stages of the "science-technology-production-consumption" cycle (prototypes of new equipment are developed, whereas the actual scientific and technical level of production is slow in rising). Moreover, planning "from the top" and "from the bottom" loses creativity, and unilateral control of the superior levels of management in relation to the inferior ones starts to dominate. The planned assignments and limits obtained "from the top" are distributed in a purely formal way among the lower levels. This makes it necessary to introduce more and more new, additional indicators, regulate in a petty way the performance of the basic cost-accounting element of production, increase the administrative machinery (as a result of which, the work of this machinery does not, by any means, become more effective).

The process of formation of planned assignments, indicators, measures and decisions must be effect both "at the top" and "at the bottom," i.e., through the joint efforts of the central, middle elements of management and planning of the economy, production groups and all workers.

An important role is also given to counterplanning. As compared to the targets for the relevant year outlined in the five-year plan of an enterprise (or association), the individual groups strive to achieve the best results and develop appropriate plans. These plans, which are coordinated with superior levels of management, are approved for the group as a counterplan. The groups receive bonuses for fulfilling it, in accordance with higher norms of deductions into the economic incentives fund. It is possible to use these norms because there is additional profit, which is provided in the counterplan, and there is also growth in economic incentive funds.

However, too little attention is being given to this progressive form, which helps develop socialist competitions, inculcation of initiative and creativity in production groups. By far not all groups undertake counterplans, nor do such plans always reveal an enterprise's reserves sufficiently. For example, there are in our republic some rather large industrial groups of Union ministries of tractor and farm machine building and the electrical engineering industry that produce much-needed equipment. However, in 1982, the enterprises of these ministries on a national scale adopted such low plans for additional output of net-standard production that they overfulfilled them by 2.2 and 3 times, respectively (PLANOVOYE KHOZYAYSTVO, No 2, 1983, pp 28-39).

In the matter of management of the economic mechanism, it is an exceptionally important task to augment the communistic awareness of all participants in social production, strengthen discipline and expand their involvement in management. To perform these tasks, it is necessary to systematically and creatively implement the decree of the CPSU Central Committe, USSR Council of Ministers, AUCCTU and Komsomol Central Committee of 1982 (June), "On further improvement of economic education and indoctrination of workers." What is the best, most effective way of organizing labor in each specific section? How are the achievements of scientific and technological progress to be used, not in general, but specifically, at a given work place? What should be done and how should one proceed to increase labor productivity, for a strict

saving of physical and labor resources at a given enterprise, in a given sector? These questions must be answered by the practical work of each participant in social production and not from a speaker's rostrum.

The community of interests of worker groups and society concerning the most important basic issues does not eliminate some nonantagonistic contradictions, both in the cost-accounting system and in its coordination with a plan. A statement made by V. I. Lenin to the effect that cost-accounting at state enterprises in view of the most pressing need to increase labor productivity, to achieve loss-free nature and profitability of each enterprise inevitably generates some opposition of interests because of the inevitable departmental interest and exaggerated departmental zeal is relevant to this day (V. I. Lenin, "Complete Works," Vol 44, p 343). Communistic awareness of the masses and Party management of the economy are of particular importance in overcoming this contradiction and providing for smooth operation of all elements, factors, incentives and parts of the economic mechanism.

Bringing up a new man is not only a goal of utmost importance, but a mandatory condition for the building of communism and, in particular, refinement and development of the machinery for intensive management. An important task for party organizations (particularly the basic production elements, enterprises and associations) is to form a new type of economic thinking, to instill in each person a need for work, clear understanding of the fact that it is necessary to work for the sake of the common good, strengthen conscious discipline, instill a creative attitude toward work, provide accurate and competent organization and remuneration of labor. For the economic mechanism and the system of controlling it operate through human labor, through separation of this labor. For this reason, the latter must be improved in every way, there has to be competent blending of creative, production and social activity of groups and their members, strengthening of the influence of party organizations on production, industrial workers and scientists. As stressed by comrade Yu. V. Andropov at the June (1983) Plenum of the CPSU Central Committee, "assuring orderly, uninterrupted operation of the entire economic mechanism is both a present need and a programmed task for the future. It is an element of the overall process of improving our social regime."

10,657
CSO: 1814/74

INTRODUCTION OF SCIENTIFIC ACHIEVEMENTS INTO INDUSTRY STRESSED

Vilnius SOVETSKAYA LITVA in Russian 7 Jan 84 p 2

[Article by Docent V. Pokormlyak, Candidate of Economic Sciences: "Shortening the Path from an Idea to Its Introduction"]

> [Text] "The state of affairs in the national economy requires a decisive switch...to the raising of the technical level of production and quality of products. Much will depend on how we mobilize the personnels of enterprises, scientific research and design organizations, engineers, technicians and scientists for the acceleration of the scientific and technological progress. This is a problem of primary importance. We are obligated to, and can, solve it". (from Yu. V. Andropov's speech at the December (1983) Plenum of the CPSU Central Committee).

Introduction of scientific achievements is still the weakest point in the "science-technology-production" chain. Many ways have been proposed for its acceleration. However, it should be said that, due to the former management mechanism, the introduction of discoveries of science and technology encounters many obstacles of various kinds today.

It was stressed at the 26th CPSU Congress that "industry must be vitally interested in a more rapid and better utilization of the ideas and research results of scientists and designers". This means that enterprises, associations and ministries must not have any other possibility to fulfill a planned task except through a rapid and complete realization of the achievements of scientific ideas embodied in plans of new technologies. However, this has not yet been achieved.

The conservatism of industrial executives and their reluctance to take advantage of new inventions, in 99 cases out of 100, are not due to their malicious intent or thoughtlessness. They avoid new inventions of engineering technology due to the fact that it is still possible to fulfill the plan without a close union with science, since the system of planning and the evaluation of the results of management are based chiefly on the quantitative parameters and the management mechanism is manpower-intensive. In this situation, there is often no place for science in industry.

The changeover of the economic policy of the CPSU to intensification radically changes the situation. Today, the whole problem is how to integrate or, simply, to combine the interests of science and industry.

The solution of the above problems was greatly stimulated by the persistent inculcation of the spirit and letter of the resolutions of the CPSU Central Committee and the USSR Council of Ministers "On Improvement of Planning and Intensification of the Effect of the Management Mechanism on the Increase of the Effectiveness of Production and Quality of Work", "On the Intensification of the Work on the Conservation and Rational Utilization of Raw Materials, Fuel, Energy and Other Material Resources" and "On Measures for the Acceleration of the Scientific and Technological Progress in the National Economy". The strategic measures outlined in them will, undoubtedly, have a favorable effect on the acceleration of the introduction of scientific discoveries into practical work, since the management mechanism is now becoming increasingly economical. Under these conditions, management will be impossible without a close contact with science.

Now, everything depends on a rapid introduction of the above resolutions. For this, it is necessary to increase decisively the controlling role of party committees of all ranks, remembering that the acceleration of the scientific and technological progress is not a tactical, but a strategical line in the CPSU policy.

Realizing the goals of the 26th Congress of the acceleration of the scientific and technological progress, we can no longer tolerate the lagging of the scientific and design base of a number of sectors of industry, associations and enterprises. Experience indicatesthat wherever this sector corresponds to the needs of scientific organization, there are higher practical results and the degree of production readiness of developed items is higher, and there are fewer mistakes, miscalculations and imperfections. In this case, the "degree of risk" of the production workers, who are the consumers of scientific products, is either minimal or there is no risk at all.

This was confirmed by the experience of leading Lithuanian enterprises. Particularly good results have been achieved by production enterprises which organized and are constantly strengthening the so-called "scientific sector". True, it is still weak and unites about 10% of the republic's potential. However, wherever such subdivisions are organized, the pace of the introduction of innovations increases considerably and, at the same time, the effectiveness of the scientific research subdivisions also increases. As an example, let us take the scientific and production relations of such enterprises of the city of Kaunas as the Radio Plant and Machine-Tool Plant imeni F. Dzerzhinskiy which are cooperating with the Kaunas Polytechnic Institute (KPI). As is known, the radio plant and KPI created several years ago a scientific production training association which actually combined the interests of scientists and production workers. It became possible for KPI to improve their all-round training of future radio engineers directly in industrial conditions. On the other hand, the radio plant has no problems with searching for a scientific institution which could solve one or another production problem. It is readily done by KPI scientists. Moreover, the faculty of the institute helps the plant to improve the business, ideological and political training of their specialists.

The distance from an idea to its introduction is considerably shortened also by the creation of laboratories of scientific research institutesdirectly at enterprises. For example, the Institute of Chemistry and Chemical Technology opened its laboratory at the Kaunas Radio Plant, and the Institute of Physics of Semiconductors -- at the Shyaulyay enterprise "Nuklon", the Institute of Physicotechnical Problems of Power Engineering -- at the Kaunas GES [hydroelectric power plant], and the Institute of Botany -- in the Kolkhoz imeni 1 Maya, Yurbarkskiy Rayon.

Practical activities of KPI scientists were very extensive. They have already organized, and continue to organize jointly with production workers, laboratories in Kaunas Shyaulyay, Klaypeda, Prenay and in other places. The effectiveness of these ties can be judged by the work experience of the scientific research sector "Vibrotekhnika" at the Maching-Tool Plant imeni F. Dzerzhinskiy. The finest air-cushion-type instruments developed here considerably simplify and speed up the most complicated measuring operations. A highly effective precision piece of equipment for the machining of components with a micron accuracy was also developed there.

Much has been done also in the republic for strengthening the experimental base of scientific research institutes. For example, the base of the Institute of Chemistry and Chemical Technology created in 1978 made it possible to improve thoroughly the technology of galvanic coatings and to shorten the cycle of the introduction of various innovations to one half or one third. This institute is noted also for the fact that its members concern themselves not only with the development of new technologies, but also with informing rapidly the consumers of their "products". For this purpose, they concluded an agreement with the center of information services of the Lithuanian Scientific Research Institute of Scientific and Technical Information and Technical and Economic Studies and distributed more than 7,000 sets of technological documentation during the period of the Tenth Five-Year Plan alone. During the past two years and more of the Eleventh Five-Year Plan, the increase rate in the distribution of the technological documentation increased even more. It is believed that the experience of this institute will be supported, since any delay in the delivery of innovations to consumers is equivalent to the reduction of their "life cycle" and lowering of the economic effect from their introduction.

Today, both in the world and in the domestic practice, there is a clear tendency toward complication and, consequently, an increase in the cost of any scientific discovery. It is explained by the fact that the more complex are the production processes, the more difficult it is to find reserves for their improvement. And if the reserves are found somewhere, the innovation must be introduced immediately everywhere where it is possible. Otherwise, it is not possible to avoid their obsolescence. Unfortunately, the system of the distribution and introduction of innovations was not formerly oriented toward scale of the country or a region or a sector of economy, but toward one or two enterprises. The effect of this scale of introduction was not great, and the expenditures seemed to be "ineffective". Such facts occur particularly frequently in the production of consumer goods, medical preparations, foodstuffs, etc.

In order to eliminate such wastefulness, it is probably necessary to introduce in statistical reports, along with the economic effect, indexes of the "breadth"

of the introduction of innovations and the speed of their passage from laboratory tests to industrial production. By tying up these indexes in appropriate way with the size of the unified fund of the development of science and technology, it will be possible to interest science and practical workers in the acceleration of the passage of a novelty through all stages of the cycle from an idea to production.

10,233
CSO: 1814/82

GUIDELINES FOR LECTURES AND DISCUSSIONS ON SCIENTIFIC AND TECHNICAL PROGRESS

Riga KOMMUNIST SOVETSKOY LATVII in Russian No 1, Jan 84 pp 84-88

[Article in the column "For Lectures and Discussions": "Scientific and Technical Progress in the Service of the Five-Year Plan"; passages enclosed in slantlines rendered in italics]

[Text] The Communist Party of the Soviet Union and our country's government are showing unfailing concern for the development of science and technology as one of the most important factors in social progress. Today the Soviet Union is a country with immense scientific and technical potential which plays a major role in strengthening its economic and defense power and in resolving tasks of communist construction.

All the peoples of our country, all Soviet people are making a contribution to strengthening the might of our socialist Homeland.

Soviet Latvia, as part of the USSR and the country's unified national economic complex, has also achieved remarkable successes in its development; it has turned into a highly developed industrial-agrarian republic and it holds an important position in the country in terms of the production of a number of industrial articles and agricultural products.

Industry has become the leading sector in the republic's economy. Industrial production accounts for more than 65 percent of the republic's gross national product and 56 percent of the republic's national income. The volume of industrial production has increased by a factor of almost 47 since 1940. The entire production output for 1940 is produced today in just 8 days. Labor productivity during this period increased by a factor of 12. The capital-labor ratio in the national economy doubled in the last decade alone, and the electric power-worker ratio increased by a factor of 1.7.

Soviet Latvia has also achieved major successes in the development of transportation, communications, and a number of other sectors of the national economy.

Soviet Latvia has a considerable scientific and technical potential. There are dozens of academic and industrial scientific research institutions and organizations operating in the republic, with about 29,000 people on their

staffs. Every year they carry out about 1500 scientific research and planning and design projects.

The republic has 26 independent design and technological organizations and a large number of design bureaus, groups, and laboratories at industrial enterprises. There are approximately 10,000 engineers and technicians working in these organizations. Every year they work on up to 2000 topics.

Social organizations such as scientific and technical societies and the All-Union Inventors' and Rationalizers' Society also make a definite contribution to the process of all-round intensification of national production and accelerating scientific and technical progress.

The republic's council of scientific and technical societies consists of 21 industrial boards which unite 190,000 people. The council of the All-Union Inventors' and Rationalizers' Society consists of 9 industrial councils and 19 industrial sections. Every year the republic's innovators introduce into production about 60,000 rationalizers' proposals and 800 inventions, for a total economic effect of over 100 million rubles.

A great deal of work directed at accelerating scientific and technical progress is done directly at industrial enterprises. During the 10th Five-Year Plan alone almost 55,000 measures for introducing new technology were implemented, and during the first 2 years of the current five-year plan, 21,000 such measures have been implemented.

/When describing this in the course of a lecture or discussion, it is useful to mention the most effective scientific and technical innovations at a given specific enterprise, and to name the best inventors, rationalizers, and innovators in production./

While pointing out the country's successes in social, economic, scientific, and technical development, the party is constantly setting new goals for the Soviet people that correspond to the growing demands for our further development. The 25th and 26th CPSU Congresses worked out a course for intensifying national production on the basis of scientific and technical progress.

In essence, a new stage has begun in implementing the science and technology policy of the Communist Party and the Soviet state. The objective need for this new stage is the result of the entire preceding development in the country's economy and it is dictated by the natural laws of a society's social and economic growth during the period of developed socialism, and by the need to unite the achievements of the scientific and technical revolution with the advantages of the socialist system of economic management.

The core and very heart of scientific and technical progress at the contemporary stage is the rapid development of science and turning science more and more into a direct productive force in society. Production becomes a logical application of science and its latest achievements. It is well known that the primary directions of the scientific and technical revolution are over-all automation of production, control, and management based on broad application of electronic computer technology, discovery of powerful new energy

sources, creation and utilization of new types of building materials and materials with prescribed properties, the development of biotechnology, and the development and incorporation of waste-free and energy-saving production processes.

The goals for accelerating scientific and technical progress were outlined in documents issued by the November (1982) and June (1983) Plenums of the CPSU Central Committee, and in the decree issued at the end of August 1983 by the CPSU Central Committee and the USSR Council of Ministers "On Measures to Accelerate Scientific and Technical Progress in the National Economy."

In this decree, the CPSU Central Committee and the USSR Council of Ministers stressed that the most important task of party, soviet, trade union, and economic organs is to make fundamental improvements in all the work being done to accelerate scientific and technical progress and to provide a major increase in labor productivity on the basis of extensive and practical implemtation of scientific and technical achievements and advanced methods.

Yu. V. Andropov pointed out at the June (1983) Plenum of the CPSU Central Committee that in order to realize this entire immense set of tasks, it is necessary "to develop a system of organizational, economic, and moral measures that would provide incentives for managers, workers, and of course, scientists and designers, to renew technology and that would make old-fashioned methods unprofitable..." Measures adopted by the party and the goverment, including measures called for in the decree issued by the CPSU Central Committee and the USSR Council of Ministers, are aimed at fulfilling this task.

The decree indicates that ministries, departments, associations, enterprises, and organizations should in the coming years guarantee the output of products that correspond in terms of their indicators to the best contemporary models.

There is a great deal of work to be done. After all, every year in the country's national economy up to 4000 different types of new machinery, equipment, instruments, and automation equipment are introduced and about 160,000 units of equipment are modernized. During the first two and a half years of the current five-year plan scientists from our republic's Academy of Sciences alone introduced 308 scientific and technical developments into the national economy, registered 350 inventions, carried out research under 447 economic agreements valued at more than 15 million rubles, and signed 12 foreign trade agreements. A wide range of work is being done within the framework of the Food Program. This work is aimed at making fundamental improvements in fodder production and increasing crop yields and soil fertility.

Today we have the task of raising the technical level and quality of all products, especially machinery that is used extensively in the national economy, such as tractors, motor vehicles, combines, and machine tools. Many different finishing parts, assemblies, and materials are needed to manufacture this machinery. The higher their technical level, the better the quality, reliability, and durability of the final product, and the more effective is our entire production process.

Intensification of the economy and increasing its effectiveness depends to a great extent on the application of progressive technological processes. Essentially new technologies that are based on major fundamental research and discoveries are responsible for revolutionizing production. A graphic example of this can be seen in processes such as laser technology, plasma technology, powder metallurgy, self-distributing high-temperature synthesis, and so on.

Scientists from the LaSSR Academy of Sciences have also made an important contribution to developing new technologies. Research done in the field of creating composite polymer materials with prescribed properties and manufacturing articles from these materials is of great importance. Achievements in plasma chemistry and magnetic hydrodynamics are making it possible to improve technological processes significantly. Latvian chemists were the first in the country to develop an extremely complex process for synthesizing peptides; the first experimental batches of these preparations have already been produced for medical and agricultural use. A process has also been developed for the first time in the USSR for manufacturing synthetic prostaglandin, which will make it possible to organize domestic industrial production of prostaglandin-based medicines. Research done in processing timber, developing the fuel and power complex, creating multiple machine computer systems and networks, and protecting metals from corrosion is of great importance for the national economy of the country and the republic.

One of the most important mechanisms for accelerating scientific and technical progress at the contemporary stage is extensive, over-all mechanization and automation of technological processes and introduction of automated control systems for all production processes. A great deal of work is being done in this direction throughout the country. In just 9 months last year, 6000 mechanized flow lines and automated lines were installed at industrial enterprises; 3500 sections, shops, and plants were completely automated and mechanized; and 153 automated control systems for production processes were created. It must be pointed out here that the production of automation and control equipment is growing at a rapid rate. The output of automatic manipulators with programmed control (industrial robots) during the first 9 months of last year more than doubled in comparison with the same period in 1982; the production of metal-cutting machine tools with numerical programmed control increased by 16 percent, with special attention being given to the "processing center" type of machine tools. The output of computer equipment and spare parts increased by 13 percent.

Work in this direction is also an important focus of the activities of Latvian scientists: they were responsible for about 35 percent of all the new technological developments introduced in the republic during the 10th Five-Year Plan and the first 2 years of the current five-year plan. Today there are 4100 mechanized and automated flow lines operating in the republic's industry; 1500 sections, shops, and plants have been fully mechanized and automated; and many automated control systems have been created for technological processes, product quality, and more. Today every fifth shop is either completely mechanized or automated.

The decree of the CPSU Central Committee and the USSR Council of Ministers is aimed at expanding significantly the use of automated machine tools, machinery

and mechanisms, standardized equipment modules, robotic engineering complexes, and computer technology; and at creating flexible automated production units and automated planning systems.

The development of contemporary technical means for transportion, storage, and loading and unloading operations in industry, agriculture, construction, and transport is an important direction in full-scale mechanization and automation. Materials handling and storage technology is becoming a more and more important element of primary production, as well as of ancillary production. Broad introduction of these means requires one-third to one-fourth the expenditures; the costs will be recovered rapidly; and it will make it possible to free up a significant number of workers.

Yu. V. Andropov, in his article "The Teachings of Karl Marx and Several Questions in the Socialist Construction of the USSR," points out: "We must devote persistent attention to resolving tasks of mechanization and automation because of their social and political importance as well. As a rule, people who have been spared from heavy, fatiguing manual labor exhibit a great deal of initiative and responsibility for the task that they have been assigned. They have additional opportunities for study and relaxation and for participating in social activities and production management. Thus they can exercise their political, democratic rights more fully...that is, the rights of sole masters of their own society and state."

When discussing the social importance of scientific and technical progress, one must not neglect the ecological factor. Man has acquired a great deal of power to affect nature and he must learn to use this power rationally.

The communist party and the Soviet state consider unfailing concern for environmental protection and the best utilization of natural resources to be one of the state's most important tasks. This has been expressed in the USSR Constitution, in decrees issued by the CPSU Central Committee and the USSR Council of Ministers, and in legislation on environmental protection. During the last five-year plan more than 9 billion rubles were spent on environmental protection measures. In the current five-year plan the state's contribution to this work is even higher.

/Here it would be appropriate to tell the audience about the prospects for scientific and technical progress in the given sector and at the given enterprise and about the goals for reconstruction, modernization of equipment, and incorporation of scientific and technical achievements into production. This would also be a good time to call on the audience to join forces to resolve these challenging tasks in a friendly and creative manner and with a high sense of responsibility./

The acceleration of scientific and technical progress would be inconceivable without improving the methods for planning and managing this progress. During the current, 11th Five-Year Plan the USSR State Planning Committee, the State Committee for Science and Technology, and the USSR Academy of Sciences, in conjunction with ministries and departments, worked out and are implementing union-wide scientific and technical programs for joint resolution of the most pressing problems in the development of the national economy.

There are approximately 170 of these programs and they call for the creation of more than 5000 new types of machinery, instruments, and materials. Sixty percent of the goals set in these programs that are tied to the production of new equipment should be met by the end of the current five-year plan. Between 1981 and 1982, 6400 types of new equipment for machine building and metalworking were put into production and 3500 units of obsolete equipment were taken out of production. There are plans to create during the five-year plan 55 new types of materials handling equipment to simplify ancillary operations.

All other levels of our national economic mechanism still need to be included in over-all special program planning. For example, sectorial scientific and technical programs are an important link in special program planning. The goals of these programs will be included in the plans of ministries and departments, and their fulfillment will become absolutely mandatory. This requires priority allocation of financial, manpower, material, and technical resources, quotas for planning and investigative work, and capital investments and contracts for construction and installation work.

Republic and regional scientific and technical programs are being introduced on a territorial basis. There is a clear need to include the basic goals of these programs in the state plans of the country, republic, and industrial sectors. During the current five-year plan 12 comprehensive special programs are included in our republic's state plan.

These programs include: reducing the use of manual labor in industry and other sector's of the LaSSR economy, developing intersectorial production enterprises, the Food Program, environmental protection and rational utilization of the republic's natural resources, developing the fuel and power complex, developing all forms of transport in the republic, and more. The journal KOMMUNIST SOVETSKOY LATVII has given detailed descriptions of these programs in the articles "The Vast Possibilities of Special Program Planning" (No 12, 1981) by A. Voss, and "Party Management in the Formation and Implementation of Comprehensive Special Programs" (No 5, 1982) by V. Dmitriyev; and in the methodological discussion "The LaSSR's Comprehensive Special Programs in the 11th Five-Year Plan" (No 5, 1983). An example of the effectiveness of the comprehensive special program method can be seen in the republic's system for controlling the quality of products and labor and production efficiency. The introduction of this system in the 10th Five-Year Plan made it possible to raise the technical level of production and product quality significantly. Throughout the republic's industry as a whole the proportion of top quality products in the total production output increased by a factor of more than 3 during the five-year period.

The ultimate goal of this particular comprehensive program is to bring the proportion of top quality products in the republic's total production output to no less than 25 percent by the end of 1985; further increases are to be baed on extensive incorporation of scientific and technical achievements into the national economy and making a planned transition from controlling the quality of products and labor to controlling production efficiency as a whole.

All these scientific, technical, comprehensive, and special programs unite the efforts of science and production; they call for work ranging from theoretical research to introduction of a new type of product into mass production; they help provide a flexible combination of territorial and sectorial planning; and they help overcome poor departmental coordination in resolving large-scale national economic tasks.

At the enterprise level, the basic directions in scientific and technical progress are formulated in plans for organizational and technical measures, in plans for introducing scientific organization of labor and new technology; at large enterprises these directions are outlined in plans for scientific research and experimental design work within the association or enterprise.

/Here we recommend using the "Scientific and Technical Progress" section in the lecture given by N. K. Baybakov, chairman of the USSR State Planning Committee; and the speech given by A. E. Voss, first secretary of the CPLa Central Committee, at a session of the USSR Supreme Soviet (in December 1983)./

Still, the best plans for accelerating scientific and technical progress can remain just plans if a reliable economic mechanism is not set in place to stimulate the creation, assimilation, and broad incorporation of new technology. The decree of the CPSU Central Committee and the USSR Council of Ministers calls for an extensive system of specific measures to stimulate scientific and technical progress, and in particular, it calls for creating new, high-efficiency technology by establishing incentive surcharges of up to 30 percent of the wholesale price. On the other hand, there is stricter control over adherence to standard time limits for renovating (modernizing) equipment and for terminating the production of obsolete products that are no longer in demand.

It has been established that the fulfillment of plans and quotas for developing science and technology is among the most important indicators used to evaluate the results of associations' (or enterprises') economic activity and for summarizing the results of socialist competition.

Decisive steps still need to be taken to strengthen all the links that are involved in creating and introducing new technology--from training scientists and specialists, stepped-up construction of and providing technical equipment for testing and experimental bases and plants, to creating reserve capacities for mastering and setting up production of progressive types of equipment and materials.

An economic experiment to increase the independence of associations and enterprises was set up in five sectors of the national economy; it will be a turning point in improving the mechanism for stimulating scientific and technical progress. There are seven Latvian enterprises and associations also participating in this experiment.

Improving the organization of production at every enterprise, every work site, and every scientific, planning, and design collective, is also of immense importance. Improvements in production regularity, scientifically sound labor norms, introduction of the brigade contract system, organization of effective

socialist competition, strengthening of conscientious discipline and organization, along with other measures, have a direct effect on accelerating scientific and technical progress and increasing national labor productivity. In the text of his speech at the December (1983) Plenum of the CPSU Central Committee, Yu. V. Andropov points out: "A great deal will depend on how we mobilize collectives at enterprises and scientific research and design organizations, and engineering, technical, and scientific personnel, to accelerate scientific and technical progress. This is a top priority task."

/In this part of the lecture or discussion, it is useful to cite some specific data on all these issues, drawing from the actual experience of the given labor collective; it is also a good idea to describe some of the immediate tasks that are facing the collective./

Scientific and technical progress is not an abstract concept, but the vital, everyday work of millions of people, which results in the process of interconnected, interdependent, progressive development of science and technology, the material foundation for social progress. All this is done by and for man. The contemporary stage of scientific and technical progress is determined by the scientific and technical revolution, which encompassed all spheres of the people's social, economic, moral, and everyday life.

Today scientific and technical progress is making ever-growing demands on man as society's main productive force: it requires a steady rise in man's cultural and technical level and skills; the development of high ideological and moral qualities, such as communist conviction, acumen, responsibility for assigned tasks, initiative, organization, and discipline. In other words, in terms of his professional, ideological, and moral qualities man must meet the demands of contemporary social development; he must be able to create and master new technology and manage production processes and the affairs of the collective and society.

Of course, the problem of educating such a man, which is outlined in the decree issued by the CPSU Central Committee and the USSR Council of Ministers, is resolved primarily on a statewide scale, starting with the creation of the appropriate social, economic, and ideological conditions in society's vital activities and ending with specific, concrete measures such as training and retraining personnel for creating and servicing flexible automated production units and automated planning systems.

The direct process of educating the new man, however, is carried out by the labor collective and its social organizations. The better organized the production process and ideological education work in the collective, the better and more rapidly will the qualities of the new man develop--the new man who will be capable of implementing scientific and technical progres under contemporary conditions.

9967
CSO: 1814/99

RECOMMENDATIONS FOR BETTER MANAGEMENT OF SCIENTIFIC AND TECHNICAL PROGRESS

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 11, 1983 pp 33-38

[Article by V. Shevchenko, department chief of the UkSSR State Planning Committee; and V. Ruban, candidate of technical sciences: "Improving the Mangagement of Scientific and Technical Progress"]

[Text] At every stage of our country's social and economic transformation the Communist Party, by creatively developing and putting Leninist ideas into practice, is constantly improving the management of the entire national economic complex and it is finding new methods, means, and forms for managing it. At the contemporary stage of economic development, which is characterized by the country's economy shifting to a course of intensive development, stepped-up scientific and technical progress has emerged as a primary factor in this intensification.

The role of science is growing; its influence on and direct involvement in the production process are increasing. Scientists from the UkSSR Academy of Sciences and the republic's VUZ's, together with sectorial scientific research institutes, planning and design organizations, associations, and enterprises, are now working on more than 660 important research projects in the natural and social sciences. In the sphere of mathematics, mechanics, and cybernetics, scientists are developing theoretical and systematic principles and methods of mathematical modelling for research, planning, and construction of complex automatic control systems for continuous technological processes and for designing new electronic computers. Active work is still being done to develop the physical principles for creating fundamentally new technological processes and construction and instrument materials and metal surfaces with prescribed physical and mechanical properties. Research is being carried out that is directed at developing methods for thorough processing of raw materials, and waste-free and low-waste manufacturing methods. Special attention is being given to meeting the goals of the Food Program. People in the agricultural sciences are working to develop new high-yield plant varieties and new high-productivity breeds of livestock, and to introduce industrial processing methods into farming and animal husbandry.

There is clear evidence of the end results of introducing scientific and technical achievements into the republic's national economy which reflect the economic effectiveness of the scientific and technical measures being carried out. Between 1981 and 1982 the republic's industry put about 2000 new types of

products into production and the economic effect from utilizing scientific and technical achievements was over 1.9 billion rubles. As a result of the increased efficiency in industry alone there was a 4.4 percent rise in labor productivity and production costs for commodity products dropped by almost 1.3 billion rubles.

The republic's scientific institutions, enterprises, and organizations, in addition to participating in 160 of the 170 union-wide scientific and technical programs, are meeting the goals of 6 republic special comprehensive scientific and technical programs: "Materials Consumption," "Metal," "The Power Complex," "The Agricultural Complex," "Sugar," and "Labor"; in addition to the goals of 35 programs to resolve the most important scientific and technical problems. The latter programs are oriented especially toward the end result, and encompassing the entire life cycle of new technological projects, starting with scientific research and ending with incorporation, and also toward the intersectorial aspects of new developments. Implementation of comprehensive programs for reducing the use of manual labor during the first 2 years of the current five-year plan made it possible to provide full-scale mechanization and automation of 5500 sections, shops, and factories. A total of 4700 mechanized flow lines and automated production lines were put into operation. Over 400,000 people were shifted from manual labor operations to mechanized and automated labor.

A special Plenum of the CPUk Central Committee, held in April 1983, was devoted to questions involving realization of these programs. The decree "On the fulfillment of the republic special combined programs and increasing the role of institutions of the UkSSR Academy of Sciences and sectorial institutes in resolving problems in scientific and technical progress" was adopted at this Plenum. The Plenum ordered the UkSSR Council of Ministers, ministries, departments, and directors of production and scientific collectives to ensure prompt and full realization of the goals stemming from union-wide, republic, sectorial, and regional scientific and technical programs; further expansion of work to rebuild and modernize existing enterprises, to introduce low-waste and waste-free manufacturing methods, and progressive forms for organization of production and labor[1].

Consistent and purposeful work is being done in the republic to improve the management of scientific and technical progress. It falls under the authority of the decree issued by the CPSU Central Committee and the USSR Council of Ministers "On measures to step up scientific and technical progress in the national economy." Stepping up scientific and technical progress means, first and foremost, that the path from the development of an idea for new technology to its practical implementation must be travelled more quickly; and thus, the end result can be obtained more rapidly. In a speech at the November (1982) Plenum of the CPSU Central Committee, Yu. V. Andropov emphasized: "If we want truly to advance the cause of incorporating new technology and new labor methods, central economic organs, the Academy of Sciences, the State Committee for Science and Technology, and ministries not only need to propagandize these innovations, they also need to identify and eliminate specific obstacles that are standing in the way of scientific and technical progress. Planning methods and the material incentive system should help to unite science and production."

In recent years special attention has been given to the program aspect of state plans for economic and social development. A special section has been introduced into the republic's annual plans to develop science and technology, called "The Basic Goals of Scientific and Technical Programs," which reflects the measures outlined in the programs. There are still some unresolved problems that are reducing the effectiveness of utilizing the special program method. The resolution of these problems lies in the area of centralized control over the development and implementation of programs; intensification of methodological developments based on the results of fundamental research; and increasing methodological assistance from the USSR State Planning Committee, the State Committee for Science and Technology, and the Academy of Sciences. It should be pointed out that a number of specific measures in this direction have already been taken. For example, for the first time in the Provision for the USSR State Planning Committee a great deal of attention is given to the program aspect of state plans for economic and social development and to organizing the development of special combined programs. According to the provision, state plans must call for the development and implementation of special combined scientific, technical, economic, and social programs, as well as programs for developing specific regions and the most important territorial production complexes. The USSR State Planning Committee, together with the USSR State Committee for Science and Technology, the USSR ministries and departments that are concerned, republic Councils of Ministers, and the USSR Academy of Sciences, are responsible for organizing the development of special combined programs. In accordance with the laws now in force, the USSR State Planning Committee is also responsible for managing the development of these programs[2].

Improving the system of indicators for the development of science and technology is aimed primarily at stepping up scientific and technical improvements in production, improving product quality, putting qualitative factors in production growth into effect, and at intensifying production and increasing its efficiency. In the process of making these improvements, old, outdated indicators are eliminated and new, progressive indicators are introduced that meet the contemporary demands for intensifying research and production and were established in a decree issued by the CPSU Central Committee and the USSR Council of Ministers for improving planning and the economic mechanism. For example, the five-year plans confirm the basic goals for carrying out scientific and technical programs, indicators of the technical level of production and the most important types of production, the economic effect from implementing scientific and technical measures, and standards for forming a single fund for developing science and technology (for industrial ministries). The annual plans for associations and enterprises confirm the goals for incorporating advanced methods in technology and the scientific organization of labor, production, and management. Under contemporary conditions one of the basic indicators is the reduction in manual labor. It should be pointed out that our republic was among the first in the country to convert (in 1980) to directive planning of indicators for reducing production costs and the number of workers by intoducing scientific and technical measures for all the UkSSR ministries and departments.

In improving the structure of the indicators, one must preserve their vertical, horizontal, and so-called functional comparability and correspondence. The

most difficult problem to solve here is the question of functional comparability; the effectiveness of performing all management functions, including forecasting, planning, plan fulfillment and control over plan fulfillment, depends on this factor to a significant extent. Inadequate functional comparability can explain the lack of correspondence among a number of plan and statistical reporting indicators, as well as among various methods used to calculate a number of plan and accounting indicators.

The implementation of measures for organizational and structural improvements in managing scientific and technical progress creates the structural prerequisites for integrating science and production. In recent years throughout the country and in the republic, there has been widespread development of scientific-production and production-technical associations and complexes; and specialized cost accounting subdivisons have been created at major industrial enterprises whose main function it is to step up the incorporation of new techniques and technology.

Today there are more than 30 scientific production associations operating in the republic. An analysis of their operations provides evidence of their high level of effectiveness. They offer joint resolution of scientific and technical problems, beginning with the research stage and ending with the creation of models of new technology and organization of series production of these models. Characteristic of the majority of scientific production associations is a higher rate of growth in gross production, labor productivity, and profit compared to the average indicators for the ministries and departments to which they are subordinate. The "research-production" cycle is reduced by an average of 15-20 percent, and in some cases it drops to two-thirds to one-half of the average. For example, the organization of a closed scientific and technical complex like that at the Electric Welding Institute imeni Ye. O. Paton under the UkSSR Academy of Sciences, that includes groups of subdivisions carrying out fundamental and applied research, technological design work, and experimental testing operations, made it possible to reduce the scientific and technical cycle to 4-5 years, which is one-half the average throughout the country.

In order to step up the incorporation of new developments and to improve their quality, in addition to methodological, organizational, and structural changes, it is necessary to provide material incentives for scientific research, design, and technological organizations and enterprises. Today, in spite of the important successes in improving the incentive system for scientific and technical progress that have been achieved in individual sectors, associations, and enterprises, there are still shortcomings in the organization of material incentives at various stages of the "research-production" cycle and at various levels of management; an effective economic mechanism for encouraging industry to apply new technology has not been implemented completely.

The decree issued by the CPSU Central Committee and the USSR Council of Ministers on improving the economic mechanism laid a centralized foundation for resolving the incentive problem. The measures outlined in the decree, as well as methodological directives issued during the development of the decree, represent a qualitatively new direction in improving the management of scientific and technical progress. It is aimed at utilizing material incentive

factors in carrying out scientific research, incorporating the highest quality technology into production, and carrying research through to an end result.

Automated control and essential resolution of the problem of increasing the effectiveness of utilizing management's information resources as its technical foundation are becoming more and more important. Academician V. M. Glushkov pointed out: "The time is coming when management of technical progress cannot be improved by improving social and economic mechanisms. It is paradoxical, but true that even among management specialists there is a belief in the supposedly unlimited possibilities of these mechanisms. These possibilities are indeed immense, but not unlimited. Under contemporary conditions, to expect an improvement in these mechanisms to provide the proper effect while preserving traditional 'paper' technology is to expect a miracle"[3].

This assertion is confirmed by actual data. For example, research done by scientists and specialists at the Cybernetics Institute under the UkSSR Academy of Sciences showed that the resolution of just the objectively necessary management tasks, that is, tasks that are independent of the management structure, requires that 10^{16} operations be carried out every year, which would require 10 billion people in the absence of automated technology[4]. If one also considers the resolution of management tasks that are tied to the introduction of new organizational forms of management, for example, the special program method, new, more differentiated indicators and the like, the volume of data operations increases many fold. The objective need to automate control over the development of science and technology is a result not only of the substantial increase in the volume of data operations. It is also dictated by the contemporary scientific and technical revolution, the essence of which lies in the over-all mechanization and automation of man's physical and mental labor. V. I. Lenin said: "...the economist should be always looking ahead, toward technological progress, or he will soon find himself lagging behind, since the person who does not wish to look ahead turns his back on history: there is no middle course and there cannot be"[5]. Under contemporary conditions progress means first and foremost automation based on electronic computers, which are the material foundation of the contemporary scientific and technical revolution and the basis for intensifying national production.

The basic indicator for intensification of production is the rise in labor productivity. The conventional method is to evaluate and implement measures that provide an increase in the productivity of physical labor. The basis of these measures is mechanization and automation, which lead to an increase in the capital-labor ratio of physical labor. This is evidence of the intensification of labor, since it provides an increase in the volume of production without bringing in additional manpower, but it involves bringing in new material and power resources. Under the conditions of over-all automation that includes the material, power, and data (in the broad sense of the word) aspects of labor, there is an opportunity to intensify production at a lower cost, since "...the input of energy and substance (physical labor) in a system to produce a given amount of information is known to be less than the savings of material and energy resources that is gained in the system through a given amount of information by decreasing the uncertainty and selecting the best ways to develop it. Under current conditions, the fight against entropy in the national economic system often turns out to be more important for its further

growth than drawing additional material and energy resources into economic circulation"[6].

Thus, over-all automation that includes material, substance, and informational processes of labor, is objectively conditional and progressive. It should be expected that at the proper stage of development, today's urgent problem of manpower resources, which is resolved by seeking out opportunities to draw the population employed in other spheres (management, education, etc.) into material and physical labor, will turn into just the opposite problem. In other words, the strategic social goal of the future should not be to draw people into material and physical production and limit them in the sphere of information production, but just the opposite--they should be diverted from the first sphere and drawn into the second, since nature itself has given man the intellect for this.

The objective, progressive nature of over-all automation makes it possible to determine the direction for stepping up scientific and technical progress that can be called the information and technological direction, the basic activities of which are: development of processes to conserve resources, robotization, and automation of control over the development of science and technology. The creation of a republic-wide automated system for managing scientific and technical development makes it possible at the initial stage to predict scientific and technical potential, to make planning estimates based on science and technology, to control the formation and implementation of the most important scientific and technical programs, to provide an operational exchange of current data on the technical level of production and on the sectors' demands for scientific research and for the scientific developments that are being carried out and are ready for incorporation. The UkSSR's automated system for managing scientific and technical development is the result and at the same time the source of further acceleration of scientific and technical progress, which along with a substantial reduction in the scientific and technical cycle, presupposes that the new technology will not become obsolete for a long time, that it will be physically durable, and that it is economical. Basic factors here include intensification of all processes in the creative stage which need to be carried out in order to put the idea into practice, and an increase in the quality of the results of these processes. Thus, the issue is acceleration and improved quality on the basis of automating processes in scientific research; in the design, planning, and performance of scientific experiments; testing models of new technology; and optimal control over the entire "science-production" cycle. Here it is also necessary to achieve integration (purposeful unification) of the processes of automating physical and mental labor, that is the physical-power and information processes.

The UkSSR's automated system for managing scientific and technical development should concentrate within itself this entire path for over-all automation. The first stage of the system was put into operation in 1980. The UkSSR State Planning Committee, ministries, departments, and territorial agencies involved in managing the republic's scientific and technical development contributed a wealth of reference, analytical, and forecasting material to help in the operation of the system. Utilization of the results of the economic analysis performed within the framework of the automated system made it possible for the UkSSR to be the first in our country to start directive planning of the

indicators mentioned above that reflect savings due to reduced production costs for commodity production and a relative decrease in the number of workers needed by raising the technical level of production.

Within the framework of the UkSSR's automated system for managing scientific and technical development, there is automated processing of data that contains both plan and reporting indicators for the incorporation of computer technology into the republic's national economy. An electronic computer is used to determine the following indicators for drafts of annual and long-range plans for incorporating computer technology into the national economy:

--the demand for computer equipment by groups of ministries and departments and over-all indicators for incorporating computer technology into the republic's national economy;

--the demand for computer equipment, and the cost and economic effectiveness of introducing automated control systems and computer technology;

--load norms for electronic computers in the plan year for each computer, by ministry and department, with monitoring and analysis of plan fulfillment and load norms.

Furthermore, analytical indicators of measures to incorporate computer technology are calculated to substantiate drafts of plans for electronic computers and various types of reference data are given out at the request of specialists from the UkSSR State Planning Committee.

The development of the UkSSR's automated system during the current five-year plan was predetermined to a great extent by the widespread introduction throughout the country and the republic of special combined programs and programs to resolve the most important scientific and technical problems, as the primary means of carrying out the special program method for managing the economy; and also by the need to increase the role of plans to develop science and technology and to increase their connections with plans for production, capital investments, and over-all indicators of plans for economic and social development.

In connection with this, in the development of a republic-wide automated system for managing scientific and technical development, which is being carried out in accordance with the specially developed scientific and technical program confirmed by a joint decree of the republic's State Planning Committee and the Presidium of the republic's Academy of Sciences, the 11th Five-Year Plan has formed the basis for entering a qualitatively new stage--the transition from an analytical pre-plan orientation performed on an electronic computer to mechanical formation in a dialogue pattern of drafts of plans and plans for the republic's economic and social development based on science and technology.

Since 1981 the republic's State Planning Committee has been submitting proposals to the State Committee for Science and Technology regarding the plan for international scientific and technical cooperation, which are formed as the republic's automated system for managing scientific and technical development is operating. The mechanical formation of proposals for the plan for

international scientific and technical cooperation made it possible to improve the technology involved in processing proposals from ministries and departments and created a foundation for increasing the effectiveness of measures involving scientific and technical cooperation.

In 1982 the first section of an automated subsystem for managing the most important republic special combined scientific and technical programs was put into operation within the framework of the republic's automated system; it was developed by the Main Computer Center Scientific Reseach Institute under the UkSSR State Planning Committee, together with the republic's State Planning Committee. For a wide range of users the subsystem provides storage, processing, and output of data on 160 union-wide scientific and technical programs, which the republic's enterprises and organizations are helping to implement; and on the republic's special combined programs: "Materials Consumption," "Metal," "The Energy Complex," "The Agricultural Complex," and "Sugar"; on the 35 republic programs to resolve the most important scientific and technical problems; and on the scientific and technical program to develop the republic's automated system for managing scientific and technical development.

As a result of the operation of the automated control subsystem for managing the republic's most important special combined scientific and technical programs, analytical data are being formulated and displayed in document form on the screens of local video terminals and on remote terminals installed on an experimental basis at the UkSSR State Planning Committee; the data concern the structures of programs and distribution of allocations for carrying out the programs from various angles (by republic, sector, ministry, department, program, sub-program, types of information, model stages of their implementation, and so forth). There is also varied data on the course of program fulfillment. This information makes it possible for management personnel to evaluate the even distribution of assignments by year; the intensity of each year of the five-year plan in terms of meeting the program goals; a graphic picture of the fulfillment of program goals during any given period; and so on. Furthermore, as a result of the operation of this subsystem on an electronic computer using dialogue conditions, the "Goals of Scientific and Technical Programs" section of the UkSSR State Plan for Social and Economic Development is formed.

As of 1983 the draft of the plan and the plan for program goals are developed using dialogue conditions and are presented in mechanical form. There are plans in the near future to use a computer to develop plan drafts for sections such as "The economic effect of implementing scientific and technical measures," and "Introduction of progressive technology, mechanization and automation of production processes."

The quality of plans worked out using a computer depends to a great extent on the effectiveness of the technological process of information exchange among organs at different levels in managing scientific and techical progress--at the intersectorial, sectorial, territorial, and local levels. Therefore, unlike the first stage of the republic's automated system for managing scientific and technical development, in which only a number of intersectorial functions of the State Planning Committee and the Academy of Sciences are automated, the

second stage of the program calls for automated control in 33 units, including 4 intersectorial, 23 sectorial, 3 territorial, and 3 local units, and for integration of the units into a single system. In 1981 the technical specifications were developed for planning and introducing these units; they were based on the model technical specifications prepared by the Main Computer Center Scientific Research Institute and the republic's State Planning Committee.

The facts listed here offer evidence of the sufficiently high degree to which the results of the UkSSR's automated system for managing scientific and technical development are used by agencies involved in controlling scientific and technical progress, including the republic's State Planning Committee, ministries, departments, and territorial organs. The system also has a noticeable effect on improving the quality of control over scientific and technical progress in the UkSSR. Specifically, there is a positive effect on: improving the quality of forecasting, planning, monitoring, and analysis of basic indicators that describe the end results of the influence of scientific and technical progress on the republic's national economy; possibilities for further expanding the use of the special program method for managing scientific and technical progress and constructing systems to manage programs, starting with an analysis of the structure which is used when developing programs and plans and ending with control over the course of their fulfillment; the creation of practical prerequisites for improving the quality of programs by utilizing the wealth of analytical material generated on an electronic computer; improving the quality of planning decisions, reducing labor and value expenditures on developing units in the republic's automated system for managing scientific and technical development, which has a direct effect on stepping up scientific and technical progress with respect to introducing computer technology.

The results that have been obtained are the effect of the approaches, methods, and means used in creating the UkSSR's automated system for managing scientific and technical development that involve planning, incorporating, and controlling developments; the primary ones are: the special program method for managing the system's creation and development; the theory of control in a space of various states; "bank" technology for planning and operation of the republic's automated system; and model planning "from the top down."

An objective prerequisite for using the special program method in managing the creation and development of a system is that the republic's automated system undergoes continuous development as an object of planning. In the life cycle of the republic's automated system there are several states: the original state; the beginning state, which corresponds to the onset of its operation; and then the special states that undergo successive development. Scientific and technical programs are worked out for each stage in the creation of a republic automated management system as models for development that correspond to the special states; they reflect the system's quantitative growth and qualitative improvement at each stage of its development.

The utilization of theoretical, methodological, and instrumental means in the theory of control in a space of states as a conceptual basis for planning a republic automated management system is oriented toward integrated computer

modelling of the required, actual, and expected states of the development of science and technology as an object of control in retrospect, in the current period, and in the future. Thus, the final special state of the republic automated management system is a state space formed in the computer memory in terms of variables (indicators) and that provides an integrated modelling of the process of the development of science and technology. This is an approach to automation based on the object, unlike the former approach, where the tasks themselves are situational and the approach to their selection is subjective[7].

The so-called "bank" technology for planning and operation of a republic automated management system is an adequate means for realizing the concept of control in a space of states and provides processing not of separate tasks, but the creation of systems without data that provide integrated modelling of the state of scientific and technical development, remote processing of data and applied inquiries, which makes it possible for final users to make the most effective management decisions.

Implementation of model planning "from the top down," which makes it possible to reduce to a minimum duplication of operations and provides methodological unity in the planning decisions that are used, is a necessary condition for integrating the units. Use of this approach has made it possible, on the one hand, taking into account the republic's specific characteristics, to introduce model developments for automating the management of the Interdepartmental Scientific and Technical Council, that are worked out by the All-Union Systems Research Institute. This has brought about a significant reduction in the labor input of the Main Computer Center Scientific Research Institute. On the other hand, model solutions based on a computer analysis of the economic effectiveness of scientific and technical measures in UkSSR industry, worked out by the republic's State Planning Committee, the Economics Scientific Research Institute, and the Main Computer Center Scientific Research Institute under the UkSSR State Planning Committee, are in effect at the Main Data Computing Center of 15 UkSSR ministries, as well as beyond the republic's borders (in the Belorussian SSR, the Kazakh SSR, the Uzbek SSR, the Turkmen SSR, and other union republics); the model technical specifications described above have been introduced at 33 units in the republic, which has brought about a significant reduction in expenditures throughout the republic as a whole as well as in other regions of our country.

As V. V. Shcherbitskiy, member of the Politburo of the CPSU Central Committee and first secretary of the CPUk Central Committee, pointed out: "improving control over scientific and technical progress is not a campaign, but a purposeful, laborious effort, that will have the proper effect only if the work is done everywhere and at every level, from the top down."[8] This is the only way to fulfill the goals set by the 26th CPSU Congress for moving the national economy toward new frontiers in science and technology.

FOOTNOTES

1. Cf. PRAVDA UKRAINY, No 96, 1983, p 1.

2. Cf. V. Kozlov, and F. Kotov, "Increasing the Role of the USSR State Planning Committee," PLANOVOYE KHOZYAYSTVO, No 10, 1982, pp 72-79.

3. V. M. Glushkov and Yu. M. Kanygin, "Chto Zhe Takoye Sovremennaya NTR?" [What Is the Contemporary Scientific and Technical Revolution?], Kiev, Economics Institute of the UkSSR Academy of Sciences, 1980, p 27.

4. Ibid., p 67.

5. V. I. Lenin, "Polnoye Sobraniye Sochineniy" [Complete Works], Vol 5, pp 137-138.

6. Glushkov and Kanygin, op. cit., p 38.

7. Cf. V. Ya. Ruban, A. F. Kirichek, and S. V. Zadorozhnyy, "Povysheniye Effektivnosti Proyektirovaniya ASY" [Increasing the Effectiveness of Planning Automated Control Systems], Kiev, "Vyshcha shkola", 1982, p 60.

8. V. V. Shcherbitskiy, "Nauchno-Tekhnicheskiy Progress--Zabota Partiynaya" [Scientific and Technical Progress--A Concern of the Party], Kiev, Politizdat Ukrainy, 1983, p 394.

9967
CSO: 1814/96

IMPORTANCE OF STEPPING UP SCIENTIFIC AND TECHNICAL PROGRESS DETAILED

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 11, 1983 pp 39-43

[Article by V. Tsys', chief of the Economic Department of the Lvov Oblast party committee: "Stepping Up Scientific and Technical Progress and Incorporating Advanced Methods--An Important Factor in the Intensification of National Production"]

[Text] The program for the country's economic and social development, outlined by the 26th CPSU Congress and the November (1982) and June (1983) Plenums of the CPSU Central Committee, places special emphasis on a course toward maximum intensification of national production. One of the most important tasks, the resolution of which is particularly pressing in connection with moving the national economy to an intensive path of development, is stepping up scientific and technical progress and strengthening ties between science and production.

A certain amount of experience in improving forms for uniting science and production has been gained in Lvov Oblast. Back in the 9th Five-Year Plan, while working out a comprehensive system for product quality control, the oblast party organization ran into a fairly widespread divergence of interests and activities between scientists and production workers, and the party organization also encountered departmental and sectorial barriers. Therefore, it is important to create in the oblast a regional system for managing scientific and technical progress on the basis of interdepartmental scientific-production complexes and associations.

Principles of socialist cooperation remained the organizational form for the operation of the complexes and associations that were created; their primary task was to carry out special scientific and technical programs. This has made it possible to develop broader interdepartmental cooperation, which in turn allowed those participating to resolve important tasks, such as exchanging scientific developments, stepping up the broad incorporation of the most progressive developments, and promoting adherence to a unified technical policy at enterprises in various sectors of the oblast's economy.

At the beginning of the last five-year plan the first four interdepartmental scientific-production complexes were created; these included a machine building complex, an instrument building complex, a geological-geophysical complex, and an agricultural complex, which united 12 scientific-production associations. The associations included 6 institutions of the UkSSR Academy of Sciences, 17

industrial scientific research and planning and design institutes, 5 VUZ's, and 24 production enterprises. The functional activities of the associations are directed by scientific and technical councils, and those of the complexes are directed by boards. Prominent scientists head the associations' scientific and technical councils and the complexes' boards; and serving as their deputies are heads of sectorial departments and other oblast party committee officials. A council has been created that includes secretaries of party organizations at scientific institutions, VUZ's, planning and design institutes, and production organizations that are members of associations and complexes. With the help of Komsomol and trade union organizations socialist competition has been organized among the associations and complexes, and new provisions have been worked out for encouraging successful fulfillment of the goals that have been set.

The new organizational form creates favorable conditions for coordinating and resolving many issues tied to the manufacture of machinery, instruments, and equipment, in which many enterprises participate. The necessary conditions are also being created for making better use of the oblast's scientific and technical potential:

--for academic institutes and VUZ's, there is more active incorporation into production of fundamental and applied research results;

--for scientific and teaching personnel at VUZ's that often lack the necessary scientific and material base, there is better access to laboratories at scientific research institutions that have the most up-to-date equipment;

--for design and technological organizations, there are broad opportunities for incorporating scientific ideas in developments and new technologies, and for their rapid application;

--for industrial enterprises, there is creation of fundamentally new technology, the incorporation of contemporary manufacturing methods, and increasing product quality and reliability.

Experience shows that in a system of regional control over the integration of science and production, interdepartmental scientific production associations and complexes have become the central link that makes it possible to unite and direct the efforts of party, soviet, economic, trade union, Komsomol, scientific and technical, and other social organizations toward a single goal. An important result of the work that has been done was the creation of permanent collectives of scientists and production workers in various scientific and technical areas who are united by a commond goal; there is joint discussion of long-range issues and departmental and sectorial barriers have been broken down.

Utilization of the oblast's scientific and technical potential has intensified significantly, and the effectiveness of science has risen. At the beginning of the 10th Five-Year Plan there were 440 scientific personnel working in the complexes; today there are more than 2000 researchers, developers, and production workers working within these complexes. The number of doctors and candidates of science participating in carrying out the complexes' scientific and technical programs has grown from 81 to 540. The amount of scientific

research on coordinated problems and financing for this research have grown by a factor of 10. The real yield from scientific research has become more tangible. Between 1976 and 1981 about 300 scientific developments were incorporated into production within the framework of the complexes, for a total economic effect of over 260 million rubles.

An induction equipment complex for thermal processing of highly durable, weighted, and balanced boring pipes was developed and put into operation at the Drogobych Experimental Machinery Special Equipment Plant. This made it possible to reduce significantly the time required to organize large-series production and to decrease the capital investments required. On the whole the activity of the machine building complex contributed to the incorporation of 8 new manufacturing methods and 10 new types of products; and developments made by organizations included in the complex are protected by more than 150 patents.

The design of the 61 LKZTs color television tube has been modernized, which provided a saving of 1000 tons of glass for every 1 million tubes produced. The annual output of tubes increased by 10 percent. In the oil fields of the Borislav deposit a new method has been introduced for extracting residual oil from beds that have already been worked, with an economic effect of 15 million rubles. A flow-line shop system for milk production has been developed and put into operation, in addition to efficient methods for livestock breeding and reproduction; new breeds of cattle have been introduced that meet the demands of highly mechanized farms and complexes.

The creation of interdepartmental complexes and associations for carrying out scientific and technical programs has shown that we must not be limited by integration processes only for fulfilling technical goals. A need arose to create the social and economic complex, within which the interdepartmental special scientific-production associations "Trud" [Labor] and "Rekreatsiya" [Recreation] are functioning.

The activities of the "Trud" association are characterized by two stages. The first stage represents the development of an integrated program for mechanization of manual labor operations; the second stage is the development and implementation of a program to increase the efficient utilization of manpower resources and to improve total employment. Implementation of this program is of immense importance when there is difficulty supplying the national economy with manpower resources: during the current five-year plan the size of the oblast's able-bodied population will increase by only 0.3 percent. Implementation of the program's measures in 1980 resulted in saving the labor of 12,000 people; and in 1981-1982, the labor of 36,000 people. The level of mechanization has risen, and manual labor is being cut back at a rapid rate.

Today there are 7 interdepartmental scientific-production complexes functioning in the oblast (taking into account the creation of 2 more--"Zdorov'ye" [Health] and a chemical-technological complex), which unite 30 special scientific-production and educational-scientific-production associations. On the basis of these complexes scientists and production workers have coordinated their work to implement 54 special programs. The annual economic effect from

the finished scientific developments in 1982 was about 70 million rubles. For every ruble spent, there was a return of 7.4 rubles. In 1982 about 43,000 rationalizers' proposals were incorporated, in addition to 492 inventions; the total economic effect was 90 million rubles.

Work is continuing in the oblast to make further improvements in managing scientific and technical progress, and to strengthen its influence on resolving important problems in the development of the national economy. There are plans to logically complete the structure of several complexes or to reorient them in accordance with new tasks that are arising in practical experience. A commission for promoting scientific and technical progress needs to be created in the rayon unit, and rayon plans for increasing production efficiency need to be formulated. This will make it possible to do a better job of combining sectorial and territorial initiatives in managing scientific and technical progress. Long-range directions for stepping up scientific and technical progress up to the year 2005 are being worked out, and the most important oblast special scientific and technical programs--"Energokompleks" [Power Complex], "Agrokompleks" [Agricultural Complex], "Kachestvo" [Quality], and "Trud" [Labor]--are being implemented.

The oblast party organization views a steady rise in product quality as an important factor in the intensive development of the economy. Work on developing and incorporating systematic methods for quality control at the oblast's enterprises began in the early 1960s. Using the Saratov system for defect-free production as a model, a system of defect-free labor was created and has been spread throughout the country and abroad. The Lvov "Izmeritel'" [Meter] Plant and the Lvov Telegraph Equipment Plant (now the Association imeni V. I. Lenin and the Association imeni 50th Anniversary of October, respectively) were pioneers in introducing this system. Planned operations to improve the defect-free labor system and extensive utilization of the experience at enterprises in Moscow, Leningrad, Gorkiy, Saratov, Yaroslav, and elsewhere, made it possible in the early 1970s to create a coordinated system for product quality control.

The All-Union Seminar of party and economic personnel held in Lvov in 1976; the Lvov Days in Moscow; the creation of an oblast House of Quality; the sectorial seminars and conferences held by the oblast party committee; the work done by quality commissions and methodological offices under the oblast, city, and rayon party committees and at enterprises, have all made a great contribution to propagandizing the coordinated system for product quality control. Today this system is functioning successfully at more than 370 enterprises in various sectors of the oblast's economy.

As a result of the extensive introduction of the coordinated product quality control system, during the 10th Five-Year Plan the output of products bearing the state Emblem of Quality increased by a factor of almost 4. Today practically all the sectors of industry produce over 1300 different articles that are top quality. True, during the current five-year plan the proportion of top-quality production declined due to the decision to remove the state Emblem of Quality from color televisions, since they represent a significant share of the oblast's industrial production. A joint program has been established and is being put into operation between the "Elektron" [Electron]

and "Kineskop" [Television Tube] Associations to create a new model of television receiver.

It should be stressed here that the introduction of systematic methods for quality control made it possible for collectives that had incorporated the coordinated system for product quality control to have a planned effect on factors that influence technical and economic indicators of production at all stages: research, planning, production, and sales. The introduction of the coordinated system for product quality control improves the organization of production, the cooperation among subdivisions, and labor discipline. Following the experience of industrial enteprises, a coordinated system for product and labor quality control is being introduced extensively at kolkhozes and sovkhozes in the oblast, in construction, at communications enterprises, domestic services enterprises, trade enterprises, and at educational institutions. Coordination of operations under this type of system in the various sectors of the national economy is being carried out by industrial sections of the oblast party committee's quality commission.

At the end of the 9th Five-Year Plan a thorough analysis was done in the oblast of losses that occur in railcar turn-around time; a set of organizational, technical, and economic measures was worked out to reduce railcar layover time, primarily during loading operations; also analyzed were the additional loading resources that could be obtained by reducing layover time. Extensive use was made of the experience gained in developing and introducing a coordinated system for product quality control in industry. Enterprises' standards were used in the development of a coordinated system for efficient railcar use as the system's organizational and technical base, as was the case in developing the coordinated system for product quality control; establishing plan norms for railcar-hours (instead of the number of railcars) became the noramative base. The "railcar-hour" indicator, which was used formerly only to determine the material responsibility for excessive railcar layover time, became a basic, all-purpose indicator instead of a secondary indicator, and it has turned into an effective economic lever in the economic mechanism for managing the shipping process, and a criterion for making quantitative evaluations of work quality.

For every five-year plan in the oblast a long-range plan is confirmed for developing transport shops at enterprises and freight services on the Lvov section of the railroad. As a result, in the 10th Five-Year Plan there was an 8-fold increase over the 9th Five-Year Plan in the capital investments used by industrial enterprises to develop transport services, and there was a 4-fold increase in those used by railroad enterprises. In order to combine the efforts to improve the use of rolling stock at 14 important freight stations in the oblast, councils were formed that consisted of the first secretaries of primary party organizations at industrial enterprises and at railroad and motor transport enterprises; the Lvov, Stryy, and Sambor central party committees were formed. At 260 primary party organizations there are commissions for monitoring the activity of the administration for rational utilization of transport facilities and equipment.

Under the Lvov Railroad Administration an office was set up to direct, assist, and monitor the course of development and introduction of a coordinated system for the efficient use of transport facilities, and coordinating working groups

were set up at all the railroad's departments. Time has proven the high effectiveness of introducing this system. In 1975 only 26 percent of the enterprises were meeting the established norm for railcar layover time; in 1980, 49 percent were meeting the norm, and in 1982, this figure reached 51 percent. Throughout the oblast as a whole, in 1982 there was a savings of 17,000 railcar-hours.

We are devoting a great deal of attention to fulfilling the party and government decisions on the production of goods for the people. A form for carrying out this work that has proven worthwhile is the organization of exhibits and public showings of consumer goods. New assortments of products are shown at the exhibits. Economic, party, and soviet executives attend these exhibits and examine the goods. There is a creative exchange of experience , and party organization secretaries and directors of enterprises hear of various desires to organize mass production of the goods. Consumers' conferences are held, along with days for industrial workers in shops, quality days at enterprises, and other types of activities.

All this work is coordinated by a commission under the party oblast committee and the oblast soviet executive committee for control over production and delivery of consumer goods, which is headed by a secretary of the oblast party committee. Every year the commission collects suggestions from enterprises, production associations, oblast administrations, city rayon soviet executive committees for additional, above-plan production of goods that are in mass demand and decides questions that involve establishing for the enterprises the volume of above-plan production for each type of product, for putting new products into production, and for taking goods out of production that are not in demand.

The heightened attention given to consumer goods by party organizations has made it possible to find new ways to increase their output, and to discover unutilized reserves. In this connection, it turned out to be valuable to create branches of large associations in small towns and settlements in the oblast where there are manpower resources. At first it was possible in a short period of time to increase the output of shoes, knitted goods, and clothing at branches of enterprises in group "B." Then this experience was borrowed by associations in group "A", for example the "Elektron" Production Association, and others. Branches of these enterprises made it possible to switch from manufacturing the simplest household articles to producing technically sophisticated goods, the demand for which is growing on a daily basis today.

The experience of operating branches of associations in group "A" in rural areas made it possible to utilize another important reserve for increasing the output of consumer goods--cooperation between kolkhozes and major enterprises for manufacturing finishing assemblies and parts. This saved industrial enterprises from making major expenditures on expanding production capacities and from recruiting additional manpower. At the same time, by obtaining finishing parts from the sections and shops that were created, enterprises have increased the output of many types of consumer goods. Finally, this type of cooperation has made it possible for thousands of young people who acquired a trade in the city to return home and participate in agricultural production. Today 30 kolkhozes in the oblast are involved in cooperation with industrial

enterprises. In 1981 the USSR State Planning Committee approved the work being done in the oblast (SOTSIALISTICHESKIY TRUD, No 10, 1982, p 34).

Party, trade union, and Komsomol organizations are devoting a great deal of attention to encouraging mass initiatives and undertakings among collectives that produce consumer goods. For example, competition among workers in related areas, the motto of which is "Everyone strives for his best labor results and works well with everyone else for the good of the consumer," has had practical success. The competition has become effective and widespread.

With the rise in production efficiency and work quality one of the primary concerns of the oblast party organization is the comprehensive development and improvement of socialist competition, and developing a communist attitude toward labor. By improving forms of socialist competition and making use of advanced methods, many collectives have achieved considerable successes in increasing productivity and improving the quality of their labor.

In recent years, collectives at leading enterprises have put forward various patriotic initiatives that have been actively supported, such as increasing production output solely by increasing labor productivity (proposed by the "Progress" Shoe Assocation and the motor vehicle plant); a competition with the motto: "No fellow workers will lag behind" (proposed by collectives at industrial enterprises in Drogobych); development of creative plans for engineering and technical personnel to mobilize internal production reserves (proposed by the "Kineskop" [Television Tube] Association); competition for putting out only top quality production (the Association imeni V. I. Lenin); and others.

Recently new forms of socialist competition and progressive initiatives have emerged. For example, competition has been organized in the oblast among industrial, construction, agricultural, trade, and municipal and domestic services enterprises and organizations for reducing manual labor, following the practice in Zaporozhye Oblast. The conditions for the competition have been worked out. At many enterprises a system has been introduced for organizing and summarizing the results of socialist competition for the best indicators of mechanization of manual labor operations and for reducing the number of workers engaged in manual labor. An oblast-wide competition has been organized for incorporating scientific and technical achievements and progressive methods into production, the motto of which is "Manual labor should be performed by machines."

At the "Elektron" Production Association a unified system has been developed and introduced for studying, generalizing, and incorporating advanced methods. It consists of a set of organizational, economic, technical, ideological, political, and social measures for managing this process. An advanced methods council created under the association's party committee coordinates the implementation of these measures. The system makes it possible to utilize and put into practice quickly the experiences of leading domestic and foreign enterprises and to spread the best practices of the association's plants and shops. Over the last 2 years, more than 250 innovations have been introduced into production through this system at the "Elektron" Association, for a total economic effect of over 1.5 million rubles. To provide practical assistance to

labor collectives at other enterprises where this system is also being introduced, the oblast trade union council and the "Elektron" Association worked out an enterprise standard: "A system for studying, generalizing, disseminating, and introducing advanced labor methods."

The brigade form of organizing labor is gaining momentum in the oblast's industrial and construction enterprises. Already more than 50 percent of the industrial workers work in brigades. In 1981 alone the proportion of people working in brigades and receiving payment based on final results rose from 20 percent to 31.6 percent. By 1985 the plan is to switch 173,000 workers to progressive brigade forms of organizing labor, which would be 57 percent of all the workers. Today there are more than 9500 people in construction working under the brigade contract system; they are responsible for over 40 percent of the total volume of contract construction and installation work.

Party and party-Komsomol groups are being formed in brigades to strengthen the role of cost accounting brigades in the life of labor collectives. Together with trade union organizations, the communists resolve problems concerning improvements in the activities of the cost accounting links, and the create the necessary conditions for the effective operation. Practice shows that in these brigades a significant amount of work time, material resources, and manpower resources is saved. There is stricter discipline and labor productivity grows considerably faster. This has been confirmed, for example, at the "Kineskop" Association, the Drogobych Chiseling Plant, the Biophysical Instrument Plant, and many other collectives in the oblast. An analysis of the operation of these enterprises shows that the labor productivity of workers in brigades is 15-20 percent higher than that of individual workers.

When discussing the effect of the brigade contract system, one should mention its immense moral and educational influence. Where brigades have been created, there is, as a rule, no room for absenteeism and laziness. We can cite many examples in confirmation of this. At the Drogobych Chiseling Plant, for instance, the cases of absences, tardiness, and early departure from work in brigades are one-fifth to one-sixth the level found among individual workers; and the labor turnover is one-third to two-sevenths of the level among individual workers. The brigade form of labor has become an important social phenomenon, since the contemporary brigade is the primary cell in a labor collective and the most important link in its structure.

It is well known that a central element among the basic principles of socialist competition worked out by V. I. Lenin is still the opportunity for practical incorporation of experience and mass application of the best methods. This principle takes on special importance in the 1980s, when the national economy will complete its transition to intensive methods of economic operation.

9967
CSO: 1814/96

IMPROVING REGIONAL CONTROL OVER SCIENTIFIC AND TECHNICAL PROGRESS

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 11, 1983 pp 49-52

[Article by V. Bogachev, candidate of economic sciences (Voroshilovgrad): "Improving Regional Control Over Scientific and Technical Progress"]

[Text] The decisions of the 26th CPSU Congress focus special attention on the need for an integrated approach to resolving major scientific, technical, and national economic problems. Proceeding from these demands, special comprehensive programs are being developed and implemented in the 11th Five-Year Plan in the national economy of the country, each republic, and various regions. These programs call for incorporation in industry of the most effective scientific and technical achievements. It was emphasized at the November (1982) Plenum of the CPSU Central Committee that our national economy has at its disposal great reserves. Yu. V. Andropov pointed out that these reserves must be sought out in the acceleration of scientific and technical progress, and in widespread and rapid incorporation of scientific and technical achievements and advanced methods into production.

Scientific and technical programs have been developed and are being implemented in Voroshilovgrad Oblast that call for the resolution of pressing problems in the development of the leading sectors of the national economy--the coal industry, chemical and oil refining industry, metallurgy, machine building, and agriculture--not only within the limits of the given region, but also on a republic-wide and union-wide scale. Collectives of scientific research institutes and production associations are helping to carry out many of the most important union-wide and republic-wide programs, as well as regional scientific and technical programs, such as the "Donbass" [Donets Basin], "Ugol'" [Coal], "Metall" [Metal], "Trud" [Labor], and "Agrokompleks" [Agricultural Complex] programs. A scientific and technical program being implemented on the basis of an agreement for creative cooperation between the UkSSR Academy of Sciences and enterprises and organizations in Donetsk and Voroshilovgrad Oblasts, includes more than 140 major projects.

A unified regional plan for scientific and technical progress for 1981-1985 is being put into practice. It includes about 70,000 different measures that are being carried out at all the industrial enterprises in the region and that are classified by sector, town, rayon, and the oblast as a whole. A plan has been developed and is being carried out for training scientific and teaching personnel in the oblast's scientific research institutes and higher education

institutions. There are 10 educational-scientific-production associations in operation, which include higher education institutions, academic and industrial institutes, production associations, and enterprises. Every year over 600 agreements for creative cooperation between scientific and production collectives are signed and implemented.

It is difficult to manage this entire system of programs and plans, especially since up until recently there was no regional control over scientific research institutes and enterprises from a single territorial center. A unified system for territorial management of scientific and technical progress has been in operation for seven years already in joint work between party and soviet organs in Voroshilovgrad Oblast and the Donetsk Scientific Center of the UkSSR Academy of Sciences. This system has made it possible to raise the economic effectiveness of the work being done by scientific and production collectives. Primary attention is given to the selection of specialists and scientists for scientific and technical progress administrative units in the region who can solve problems posed by contemporary demands.

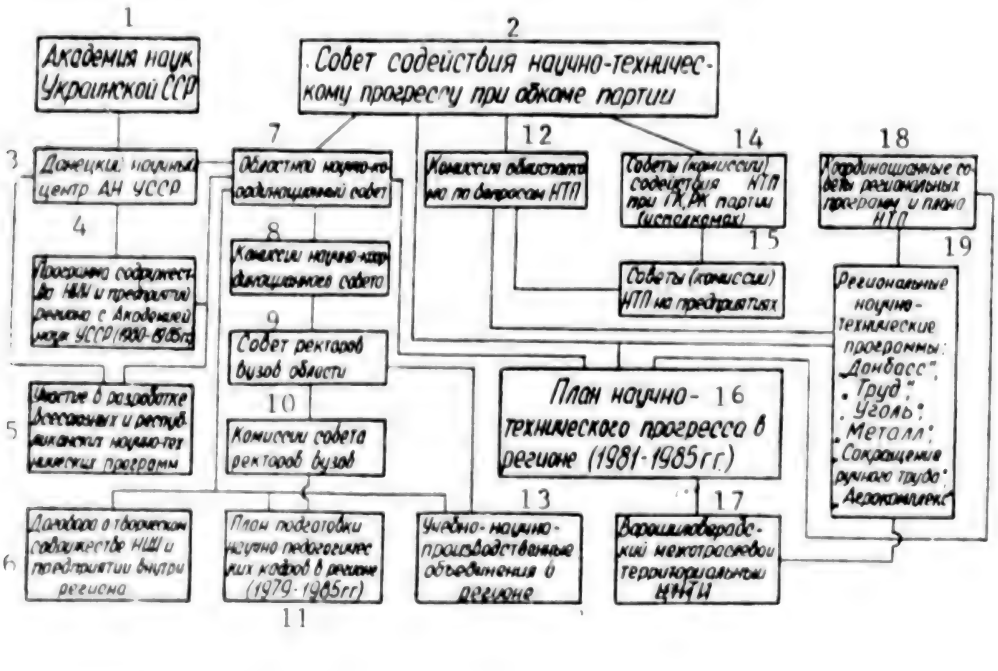
At the April (1983) Plenum of the CPUk Central Committee V. V. Shcherbitskiy remarked: "Scientific and technical progress and intensification of production depend on people, personnel, and to a great extent, their philosophical position, the breadth of their scientific and technical horizons, and their level of competence. These factors can be provided primarily by creating a personnel reserve, conditions for the ideological, political, and creative growth of the personnel, and by promoting young, enterprising workers to positions of leadership."

The diagram presented here depicts the existing system of control over scientific and technical progress; from this diagram it is evident that the most important organs in the regional management of scientific and technical progress are the council for promoting scientific and technical progress and the scientific coordinating council. The council for promoting scientific and technical progres is created under the oblast party committee. It is made up of party and soviet leaders and directors of major scientific research institutes, scientific-production associations, and production associations. The first secretry of the oblast party committee acts as chairman of the council and the second secretary of the oblast party committee acts as deputy chairman. There are six sections under the council: one for coal industry, ferrous metallurgy, machine building, chemical and oil refining industry, construction materials industry, and light and food industry.

The council actively promotes implementation of measures in the region that are directed at fulfilling the decisions of the party and the government to increase the efficiency of national production. The council performs coordinating and management functions to raise the technical level and quality of production, to incorporate into production scientific and technical achievements and progressive technology, to bring about over-all mechanization and automation of production processes, to reduce the use of manual labor, and to conserve power, raw materials, and other supplies. At the same time the council is involved directly in developing and encouraging implementation of recommendations for working in the most important progressive directions at scientific, design, and planning institutes and industrial enterprises. It

submits proposals and recommendations on the most important issues to the bureau or secretariat of the oblast party committee for review. Management is carried out through a system of administrative units operating within the region, such as the oblast scientific coordinating council, councils for promoting scientific and technical progress under city and rayon party committees, the commission on questions of scientific and technical progress under the oblast soviet executive committee, commissions under city rayon soviet executive committees, coordinating councils for regional programs, and so on.

Regional Management of Scientific and Technical Progress



1. UkSSR Academy of Sciences
2. Council for Promoting Scientific and Technical Progress under the oblast party committee
3. Donetsk Scientific Center of the UkSSR Academy of Sciences
4. Program for cooperation between the region's scientific research institutes and enterprises and the UkSSR Academy of Sciences (1980-1985)
5. Participation in the development of union-wide and republic scientific and technical programs
6. Agreements on creative cooperation among scientific research institutes and enterprises within the region
7. Oblast scientific coordinating council
8. Commissions under the scientific coordinating council
9. Council of Rectors of the Region's VUZ's
10. Commissions under the Rectors' Council
11. Plan for training scientific teaching personnel in the region (1979-1985)
12. Commission on Questions in Scientific and Technical Progress under the oblast soviet executive committee
13. Educational-scientific-production associations in the region
14. Councils (commissions) for promoting scientific and technical progress under city and rayon party committees (soviet executive committees)

15. Councils (commissions) on scientific and technical progress at enterprises
16. Regional plan for scientific and technical progress (1981-1985)
17. Voroshilovgrad Intersectorial Territorial Scientific and Technical Information and Propaganda Center
18. Coordinating councils for regional programs and the plan for scientific and technical progress
19. Regional scientific and technical programs: "Donbass" [Donets Basin], "Trud" [Labor], "Ugol'" [Coal], "Metall" [Metal], "Sokrashcheniye ruchnogo truda" [Reducing Manual Labor], "Agrokompleks" [Agricultural Complex]

The Voroshilovgrad Oblast Scientific Coordinating Council was created in accordance with a decision made by the bureau of the oblast party committee and the Donetsk Scientific Center of the UkSSR Academy of Sciences in 1976. The composition of the council was confirmed by the bureau of the oblast party committee, and it included economic administrators, secretaries of party organizations at scientific research, planning, and design institutes and organizations and higher education institutions, and leading scientists. Eight commissions were formed under the scientific coordinating council to deal with the following problems: improving product quality; increasing labor productivity and production efficiency; creating and introducing automated production control systems; mechanization and automation of production processes, environmental protection and rational utilization of natural resources, and so on.

The operating plan for the scientific coordinating council, its bureau and commissions is confirmed yearly. The Donetsk Scientific Center of the UkSSR Academy of Sciences manages the activities of the council, its bureau, and its commissions. The creation of the council and organization of its operations has made it possible for the oblast party committee to obtain complete and extensive information on the work of scientific, planning, and design institutes and organizations and to have an influence on improving their operations. The opportunity arose to bring to light and disseminate advanced methods and to uncover and promptly eliminate existing shortcomings. As a result, ties between scientific institutions under sectorial and academic authority (including ties on a union-wide and republic-wide basis) have grown stronger and have expanded considerably, and strong working contacts have been established between scientists and production workers by drawing them into joint work to resolve problems of an intersectorial, multi-dimensional nature; these ties are of great importance for the region's economy.

The scientific coordinating council developed conditions and recommendations for organizing socialist competition among four groups of scientific research institutes and VUZ's. The results of the competition are summed up once a year and the winners receive Red Challenge Banners from the oblast party committee, the oblast soviet executive committee, the oblast trade union council, and the oblast Komsomol committee, in addition to certificates of honor. The scientific coordinating council, together with the Council of Rectors of VUZ's, monitors fulfillment of the plan to train scientific and teaching personnel. The members of the coordinating councils for regional programs and a unified plan for scientific and technical progress are confirmed by the bureau of the oblast party committee for the period during which the regional programs are to be fulfilled. The councils are headed by the secretaries of the oblast party

committee and deputy chairmen of the oblast soviet executive committee. Included in each of the councils are chiefs of sectorial departments under the oblast party committee and organizers in science and production.

Implementation of regional programs, the plan for scientific and technical progress, and other programs to develop science and improve production includes realization of organizational, technical, technological, and supply measures. The huge volume of work requires careful control and prompt, skilled management. In connection with this, the need arose to develop special methodological instructions for monitoring implementation of measures for scientific and technical progress. Recommendations of this nature have been prepared by scientists at the Voroshilovgrad Affiliate of the Industrial Economics Institute of the UkSSR Academy of Sciences, under the direct guidance of the science and educational institutions department of the oblast party committee. These recommendations outline a system for monitoring fulfillment of goals set down in union-wide and republic-wide programs, in regional scientific and technical programs, and in the plan for scientific and technical progress; they also describe a system for summarizing the results of socialist competition and for determining the economic effectiveness of the measures for scientific and technical progress that have been carried out.

An important link in regional management of scientific and technical progress is obtaining information from those performing the work on how they are fulfilling the programs, plans, instruction, directives, and recommendations of the coordinating units. This information, in addition to current, operational information, falls into two categories. Once a year (in March) councils for promoting scientific and technical progress (or commissions) in towns and rayons receive the required reports from production associations and enterprises; the councils analyze the information, summarize it, and send it on to sections of the oblast council for promoting scientific and technical progress and to coordinating councils for regional programs and the plan for scientific and technical progress. At the same time, the commissions of the scientific coordinating council in turn are receiving information from scientific research and planning and design institutes and from organizations and VUZ's on their fulfillment of plan goals. This information is summarized and submitted for review to councils for promoting scientific and technical progress, the scientific coordinating council, sectorial departments, the secretariat and bureau of the oblast party committee. In many cases appropriate decisions are made regarding these issues.

With the aim of providing the necessary practical, methodological assistance locally (in towns, rayons, and enterprises) to fulfill regional programs and the plan for scientific and technical progress, a number of leading scientific research institutes and other organs are chosen to be main coordinators. For example, the Voroshilovgrad Affiliate of the Industrial Economics Institute of the UkSSR Academy of Sciene is the main coordinator of the "Donbass" regional scientific and technical program and the plan for scientific and technical progress; the "Uglemekhanizatsiya" [Coal Mechanization] Scientific-Production Association is the main coordinator for the "Ugol'" program; the labor department of the oblast soviet executive committee is main coordinator of the "Trud" program, and so on. The main coordinators also present material for

to the oblast coordinating commission for review and for selection of the winners in the socialist competition.

An active form for implementing measures for scientific and technical progress in our oblast is the republic-wide review of the incorporation of scientific achievements into production that was conducted at the initiative of the CPUk Central Committee in January and February 1982. The review included not only an analysis of the activity of scientific and production collectives aimed at increasing production efficiency, fulfilling scientific research plans, and creating new technology and progressive methods; its primary focus was on finding new, practical solutions for these problems. Special attention was given to organizing the fulfillment of republic and sectorial scientific and technical programs and agreements on creative cooperation between scientific and labor collectives. The materials from the review were analyzed thoroughly by oblast, city, and rayon commissions that were formed at the time to conduct the review, and the results were also examined by party committees.

Application of this system for regional management of scientific and technical progress makes it possible to guarantee a high level of economic effectiveness in the implementation of plans, programs, and measures for scientific and technical progress. Between 1976 and 1982 more than 5000 developments were worked out and implemented, with a total economic effect of about 3 billion rubles. The return on each ruble spent in 1982 was 7.8 rubles, which means that the return increased over the 1975 level by a factor of more than 3. The average annual economic effect from incorporating developments into production during the last five-year plan was 338.5 million rubles; in 1981 it was 588 million rubles and in 1982 it was 676 million rubles.

A total of 645 types of machinery, equipment, instruments, and means of automation are now being produced on the basis of developments worked out by scientists and designers at scientific institutions and organizations in the oblast, 220 of which are top quality products. Between 1976 and 1982 467 mechanized flow lines and automated production lines were put into operation at the oblast's enterprises and 514 shops and sections were completely mechanized and automated. A total of 1981 new types of industrial products have been developed and put into production, 309 of which are being produced for the first time in the country. Many other important measures are being carried out which characterize the high level of quality found in the work done by scientific and production collectives.

There is no doubt that the system for managing scientific and technical progress will be undergoing constant improvements. For example, the system for receiving and analyzing information on the fulfillment of programs and plans for scientific and technical progress needs to be improved considerably. With the aim of accelerating the practical involvement of coordinating units in carrying out the measures that have been outlined and in guaranteeing strong final results, it is necessary to specify and differentiate the functions of regional management of scientific and technical progress between the council for promoting scientific and technical progress and the commission for scientific and technical progress under the oblast soviet executive committee.

There is no question, though, that the system described here has become an effective way of drawing scientific and production collectives into active, creative work toward resolving the pressing national economic tasks of the 11th Five-Year Plan.

9967
CSO: 1814/96

INTERACTION OF AUTOMATED SYSTEMS IN THE REALIZATION OF SCIENTIFIC AND TECHNICAL PROGRAMS

Moscow VESTNIK STATISTIKI in Russian No 11, Nov 83 pp 33-38

[Article by G. Alekseyev, GKNT department chief, M. Golubintseva, USSR TsSU department deputy chief, R. Sokolov, department chief, and G. Kulakin, sector chief, All Union Scientific Research Institute for Problems of Organization and Management (VNIIPOU)]

[Text] The interaction of the subsystems "Planning of Scientific and Research Work and Utilization of the Achievements of Science and Technology in the National Economy (ISPLANIR)" of the GKNT [State Committee on Science and Technology] and "Statistics of Technological Progress" of the ASGS [Automated System for State Statistics] is based on the functions of planning and control of the tasks of the state plan for the economic and social development of the USSR pertaining to the section "Development of Science and Technology" performed jointly by the GKNT and the USSR TsSU [Central Statistical Administration]. This section includes: special-purpose complex scientific and technical programs and programs for solving the most important problems (scientific and technical programs) developed for the realization of the most important scientific and technical achievements substantially improving the effectiveness of production and the quality of products.

A scientific and technical program is a planning document which contains a complex of scientific-research, designing and experimental industrial jobs intended for solving scientific and technical problems of intersectorial nature. As a rule, such a complex is oriented toward the development of new equipment, materials and technologies and is represented in programs by interrelated structural elements (assignments, stages and substages of their execution).

The names and technical and economic characteristics of new products, materials, etc are given in the assignments of the programs, technical charts, calculations of economic effectiveness and other planning, report and reference documents accompanying the programs.

Scientific and technical programs contain more than 30,000 assignments and stages of their execution, each of which is characterized by a number of indexes, such as execution deadlines, executing organization, expenditures, etc. This section of the plan includes hundreds of thousands of indexes. The processing of such data files requires the use of computing equipment.

For this purpose, the GKNT is developing the subsystem "Planning of Scientific Research Work and Utilization of the Achievements of Science and Technology in the National Economy (ISPLANIR)", and the USSR TsSU is developing the functional subsystem of the ASGS "Statistics of Technological Progress".

The first section of the ISPLANIR was put into operation in 1978. This functional subsystem is intended for solving problems on the basis of the files of planning and report data of scientific and technical programs.

The initial information file contains: a complete text of the scientific and technical programs of more than 10 Mbyte; changes made in the programs; report data on the execution of the programs; reference data, for example, lists of the sectors of the national economy and industry, ministries and departments, statistical administrations, subdivisions of the GKNT, organizations participating in the execution of the programs, etc.

This information file is used, chiefly, for the recording and current evaluation of the progress of individual scientific and technical programs and the entire program of the cross section of the state plan for the development of science and technology, and for the accumulation and generalization of information about the fulfillment of tasks in order to form normative indexes and, particularly, financial and time expenditures.

Let us enumerate the special characteristics of the formation and functioning of the information file which are important in the automation of its processing:

dispensing with the transfer of planning and report documents to machine-oriented forms;

complexity of the structure of initial documents which, along with digital information, contain a considerable amount of textual information;

the necessity of entering large files of planning data at the beginning of the five-year plan in the shortest possible time, and entering report data after each report period;

ensuring the fidelity of the stored data, variety of requests for their processing and the output of machinograms.

These characteristics have determined the software and hardware used in processing which make it possible to ensure the input of digital and tectual indexes from documents of a free format, control of the input data, the possibility of multiaspect search, and data grouping and output.

Requests are formed by the user in the natural language of the subject area, are drawn up in the form of a special blank and are entered from the screen of a video terminal or from perforated cards. Automated processing of requests is done by a complex of program modules whose performance sequence is controlled by the program supervisor. (The length of the processing of a request, searching for the necessary data and the delivery of machinograms is 0.5-7 minutes, depending on the breadth of searching and complexity of processing). The softward is prepared in the algorithmic language PL/1 with the use of the operating system of EVM [electronic computer] YeS-1033.

The output information is formed as single references, report-type references according to the established form and retrospective statistical studies which are issued in accordance with the established schedule or at the request of the users.

Now let us examine the functional subsystem ASGS "Statistics of Technological Progress". As is known, the most important purpose of the statistics of technological progress is to monitor the progress of the fulfillment of the plans for the development of science and technology, including the tasks of scientific and technical programs, and effective provision of administrative, planning and economic agencies with reliable report data necessary for economic analysis.

The development of the above subsystem is directed toward further improvement of the quality and effectiveness of report data on the problems of technological progress through automation and creation of conditions for the changeover to modern methods of collection, processing, storage and transmission of information. The work on the functional subsystem ASGS "Statistics of Technological Progress" planned for the Eleventh Five-Year Plan includes the creation of a complex of electronic processing of information (EOI) on the fulfillment of the tasks of scientific and technical programs, including special-purpose complex programs.

This problem is being solved within the framework of the interacting subsystems.

For the organization of the monitoring of the fulfillment of all tasks included in the scientific and technical programs, the GKNT, in cooperation with the USSR TsSU, conducted extensive work on the improvement of the methodology of planning and registration of program tasks, forms of statistical reports, and procedures for collecting and processing information.

Improvements of the statistics characterizing the progress in the fulfillment of scientific and technical programs were done on the basis of higher requirements imposed on the contents of programs.

The GKNT, the USSR Gosplan and the USSR TsSU jointly developed and approved the "Procedures for the Organization and Presentation of Reports About the Fulfillment of Scientific and Technical Programs and Plans for the Development of Science and Technology". They coordinated and approved improved forms of statistical reports and indexes which are used as a basis for monitoring the fulfillment of scientific and technical programs. They also developed and implemented a classifier of reasons for nonfulfillment of jobs.

A number of changes and additions were made in the instructions on the procedure of the compiling and presentation of reports about the fulfillment of research, experimental, planning, designing and technological jobs and assignments of scientific and technical programs, the forms and indexes of summary reports on the fulfillment of scientific and technical programs were coordinated, and the statement of the tasks was prepared for the EOI complex about the fulfillment of the assignments of scientific and technical programs.

The interaction among the subsystems is realized in stages, and at each stage concrete methodological problems of planning, registration and reporting, as well as organizational and technical problems, are solved.

At the present time, conditions have been created for involving the two above-mentioned functional subsystems in the process of mutual information exchange during the processing of planning and report data of scientific and technical programs.

The interaction of the subsystems will make it possible for specialists to solve functional problems using unified files of planning and report data, as well as to expand substantially the scope of analytical information through combined processing of periodic reports of the USSR TsSU and the textu information of scientific and technical programs contained in the data base of the ISPLANIR.

This interaction will make it possible for specialists engaged in the processing of planning and report data during their work on scientific and technical programs to create a processing system for the data of the state scientific and technical programs. The main technical and program components of this system, the network for data transmission of telegraph reports of the USSR TsSU and the data base of the ISPLANIR, are already functioning. When the above-mentioned components are interacting in an automated mode, it is possible to shorten the time of the presentation of statistical data to the USSR Gosplan and the GKNT, to reduce the labor input in data processing, to lower the cost of the development of each of the subsystems, as well as to improve the fidelity of data.

The development and implementation of concrete solutions in the organization of data exchange among the subsystems is determined by the level of readiness of each one of them for the delivery of the necessary information. One of the main problems in the exchange of planning information between the GKNT and the USSR TsSU is the reduction of the length and labor input in the processing of data on the tasks and stages of scientific and technical programs.

The technology of planning data processing includes the operations of selection from the entire volume of work to be completed in the monitored planning and reporting period (year, quarter), registration of changes introduced into the programs since the time of their approval, filling out special forms (registration cards) for each job and their distribution to local statistical agencies in order to ensure timely and accurate report data on the progress of the execution of scientific and technical programs. Quarterly execution of these operations requires a considerable labor input of the specialists of the Soyuzmashinforma of the USSR TsSU.

At the same time, operations of the selection of planned assignments from the file of the scientific and technical programs and the registration of changes are automated in the subsystem ISPLANIR. Moreover, it is possible to form registration cards in the form of machinograms, which makes it possible to lower considerably the labor input for their preparation. Under these conditions, it is natural to organize the interaction of the ASGS and ISPLANIR with the use of the potentialities of the latter for informing statistical administrations about planned tasks.

This makes it possible to shorten sharply the length and labor input of the preparation of report cards, because the machinograms can be used by local statistics agencies after introducing special requisites of the USSR TsSU.

The main problem of the organization of the interaction of the processing of report data is to reduce the time of the preparation and presentation of summary reports about the progress of the fulfillment of jobs in the realization of scientific and technical programs, as well as a more profound development of the analytic information which is necessary for economic analysis.

The solution of this problem is connected to a considerable degree with the organization of the exchange of data of periodic and postal reporting on technical carriers of information. There is a possibility of recording the data of periodic reports arriving to the Soyuzmashinform of the USSR TsSU through a teletyper on technical carriers of information. The use of these carriers for entering report data in the subsystem ISPLANIR will lower considerably the labor input and the input time, which will make it possible to reduce the time of the preparation of analytical and summary data about the progress of the fulfillment of scientific and technical programs which are presented to the managing and planning agencies.

On the basis of the data of periodic reports, it is possible to print out the text of planned assignments and to select completed and uncompleted assignments for the development of new equipment, materials, technological processes and other types of new items, grouping them by a number of indicators.

The exchange of report data about the fulfillment of scientific and technical programs using technical carriers of information will make it possible to reduce almost to one half the length of the preparation of a summary report about the progress of the fulfillment of scientific and technical programs based on the data of periodic reports and to deliver machinograms containing analytic information, for example, of the data on the number of assignments completed by ministries and departments in connection with the development of technical innovations with their distribution by the planning and report periods and other information.

In the process of the exchange of information between the GKNT and the USSR TsSU, an experiment was conducted for the purpose of improving the forms of organization of the exchange of information and evaluating the possibility of lowering labor input into automated processing of planning data of scientific and technical programs for reporting them to local statistical agencies.

The experiment was conducted in the course of one year on a data file of one sector of industry with an information content of more than 1 Mbyte. The exchange of machinograms and report information was done quarterly.

The experiment confirmed the adopted form of exchange in the form of an interaction procedures record, and its rational structure was revealed. The procedures record defines the rights and obligations of the parties, forms of documents and the procedure of their circulation, the necessary dictionaries and classifiers, as well as the procedures for correcting documents. The latter are drawn in accordance with the "Temporary Industry-Wide Guidelines on Imparting Legal Validity to Documents Recorded on Magnetic Tapes and Paper Carriers Produced by Computers" approved by the GKNT.

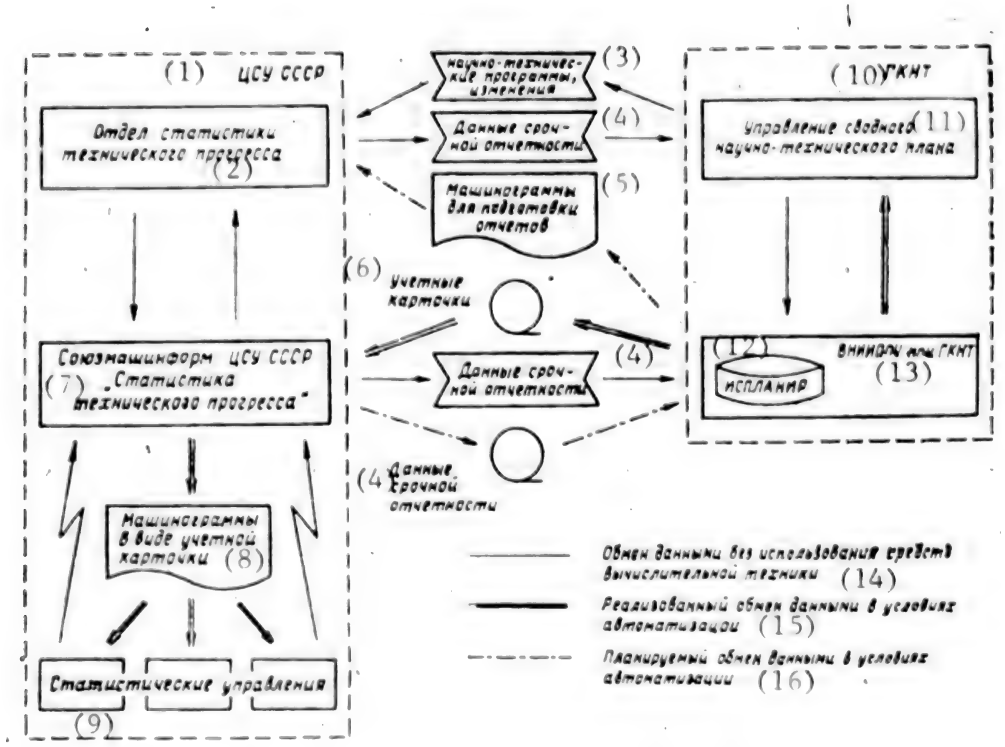


Diagram of information exchange between GKNT and USSR TsSU through the interaction of subsystems ISPLANIR and "Statistics of Technological Progress"

Key:
1. USSR TsSU
2. Department of Statistics of Technological Progress
3. Scientific and technical programs, changes
4. Data of periodic reports
5. Machinograms for preparation of reports
6. Registration cards
7. Sovuzmashinform of the USSR TsSU, "Statistics of Technological Progress"
8. Machinograms in the form of registration cards
9. Statistical administrations
10. GKNT
11. Summary Scientific and Technical Plan Administration
12. ISPLANIR
13. VNIIOPU of the GKNT
14. Data exchange without the use of computers
15. Realized data exchange under the conditions of automation
16. Planned data exchange under the conditions of automation.

As a result of the experiment, evaluations were obtained for labor input into the formation of report cards of assignments and stages of scientific and technical programs. Manual labor input in the formation of 100 report cards is six man-days, while it is 1.5 hours in the automated mode.

Economic expediency of the interaction of the subsystems "Statistics of Technological Progress" and the ISPLANIR on a complete file of scientific and technical programs was proved. By the results of the performed work of the first stage of interaction, an agreement was reached to expand the list of the indexes of report documents and the problems being solved jointly. New data were introduced into scientific and technical programs which make it possible to group assignments and stages of work by territories and indicators characterizing statistical administrations.

The GKNT, jointly with the USSR TsSU, developed and approved the procedure record for the interaction of subsystems during the exchange of information based on a complete file of scientific and technical programs of the Eleventh Five-Year Plan.

The enforcement of this procedures record started the second stage of interaction: exchange of data on technical carriers of information.

Since the second quarter of 1982, planning data of scientific and technical programs are transmitted quarterly to the Soyuzmashinform of the USSR TsSU on magnetic tapes. Preparations are in progress for the transmission of periodic report data to the subsystem ISPLANIR on technical carriers of information, for which work is being done on setting up communication between computers and teletypes used for collecting periodic report data from local statistical agencies.

The connecting of teletypes to the computer is not costly and makes it possible to "close" the circuit of automated data processing of the state scientific and technical programs consisting of the data base of the ISPLANIR and the operating network for the transmission of periodic report data.

The improvement of the procedures of data exchange on technical carriers of information is of great importance for shortening the time of the presentation of report data about the progress of the fulfillment of state scientific and technical programs and for reducing the labor input in their monitoring under the conditions of a closed automated circuit of processing planning and report data.

In recent years, program-oriented methods are used at the republican and sectorial levels of the national economy. The state five-year plans for economic and social development of the union republics include also scientific and technical programs. In this connection, the TsSU of the union republics have the responsiblity to organize the monitoring of their fulfillment. The experience accumulated in the organization of the interaction of the subsystems ISPLANIR of the GKNT and the "Statistics of Technological Progress" of the USSR TsSU for monitoring the progress of the fulfillment of scientific and technical programs may be useful at the republican level.

10,233
CSO: 1814/84

THE ECONOMIC AGREEMENT: A GRANT OR PAYMENT FOR LABOR?

Yerevan KOMMUNIST in Russian 31 Jan 84 p 2

[Article by V. Chalabov, candidate of technical sciences; passages rendered in all capital letters printed in boldface in source]

[Text] Professor Lev Grigor'yevich Minasyan, prorector of the Yerevan Institute of Zooveterinary, was giving a lengthy and enthusiastic account about the Institute's successes in fulfilling scientific research subject matter, particularly economic agreement projects, and about the annual growth in funds being acquired, an increase in the number of performers, and at the same time an expansion in geography of customers financing the projects. The economic effect here from introducing the results of scientific development is rather high, with the return from every ruble of funds invested in science reaching a minimum of 3-4 rubles, and in some years even more.

A familiarization with documentation confirms that the amount of funds spent on fulfilling the economic agreement subject matter is small. It is planned to spend from 5,000 to 30,000 rubles on one project. All amounts are fully spent on all items indicated in the agreement.

From time to time there are projects for which funds remain unused.

The question arises: Is this economy? No, it is something else. Provisions were not made in advance, i.e., before conclusion of the agreement, on where and how to purchase equipment, gear, supplies and reagents and on preparing in advance to perform the research.

In 1982 22 economic agreement subjects were carried out by the Institute for a total amount of 192,000 rubles. As a matter of fact, however, expenditures comprised 148,000 rubles, with 44,000 to have been used to acquire equipment, reagents and supplies, but this sum remained "unassimilated."

Whatever the estimate of expenditures in economic agreements, the planned funds are punctually taken out, but on such items as supplies, articles comprising a package, and special equipment the funds are not expended or miserly amounts are spent in the best instance.

Take for example the estimate for Subject 08: "Improving the quality of rennet cheeses by using new, highly efficient detergents and disinfectants." It is planned to spend 50,000 rubles, of which 4,000 are for acquiring special equipment, 2,000 are for supplies and 20,000 for wages. Well then, wages were fully taken out for the entire estimate, but 3,000 rubles instead of the authorized 6,000 were spent for special equipment and supplies. And for many other subjects the excess of income over expenditures comprises enormously greater amounts...

Just how can scientific research be performed without the necessary special equipment? And if it is not needed, then why provide for the procurement in estimates?

Ye. Aslanyan, chief of the Institute's scientific research sector, says that it is impossible to acquire the necessary equipment, supplies and reagents given in the estimate of expenditures.

Many performers encounter this problem. Unfortunately, the "procurement" process takes an excessively large amount of time from science workers and most often proves unsuccessful.

Science is not inexpensive. At times it is rather difficult for the performer of economic agreement projects to scrape up funds "for a half-rate." Quite often amounts are made up out of thin air to see who can come up with how much money! TO THIS DAY THERE IS NO PRECISE DEFINITION OF EXPENDITURES FOR PERFORMANCE OF NIR [SCIENTIFIC RESEARCH WORK]; EVERYTHING IS APPROXIMATE AND TENTATIVE. There are cases where substantial work needed by production is performed where the amount of financing is modest and the planned and actual expenditures coincide to a T...

The economic agreement subject "Development of a method and equipment for introducing liquid and powder conservatives in the chemical preservation of green fodders," being carried out at the Institute of Zooveterinary's chair of mechanization and electrification of agricultural production under the direction of Professor and Doctor of Technical Sciences S. Markaryan, is planned for three years. Equipment has been made which for the second year now is successfully undergoing production tests at the Zovuni Sovkhoz of Nairiyskiy Rayon and at the Institute's educational and experimental farm. Reassuring results have been obtained.

At the present time technical documentation on the equipment and practical recommendations for wide introduction of the developed method on republic farms are being drawn up. According to scientists' estimates, this development promises great economic effect with its mass introduction on the farms: manual labor is mechanized and working conditions are improved.

The equipment is supposed to function in each farm, but introduction of the machine is threatened. Matters rest on the absence of a manufacturing plant. What does this mean? It means that UNTIL AN ENTERPRISE IS DECIDED UPON WHERE THE NEW EQUIPMENT WILL BEGIN TO BE MANUFACTURED, THE SCIENTISTS' WORK IS "ON

THE SHELF." THIS IS A SPECIFIC INSTANCE WHERE FULFILLMENT OF THE ECONOMIC AGREEMENT REMAINS MERELY AS AN "ADDITION" TO THE SCIENTIST'S WAGES.

Or take another example. Chair associates S. Markaryan and G. Musayelyants developed the PKB-2 pull-type combine together with workers of the Armsel'khozmekhanizatsiya NPO [Scientific Production Association] for pelletizing hay right in the field. In comparison with baling, the technology permits full mechanization of all hay procurement processes from the field to the trough; reducing its losses in picking it up in the field, transporting it and distributing it to the animals; increasing the nutritive value of fodder, and so on.

The combine gave a good account of itself in pelletizing hay, alfalfa and saintoin in fields of the republic's Abovyanskiy and Nairiyskiy rayons and received approval from farm specialists. Back in 1978 the machine successfully passed state tests and was recommended for production of a test lot. To this day, however, work has not continued because of the lack of a manufacturing plant.

Meanwhile, both developments are promising and each can provide hundreds of thousands of rubles of savings when they are widely applied in agriculture. It would appear that little remains but to introduce them, but the troubling fact is that many promising models of new equipment and proposals published in universities for improving technology cannot find the path to practical work. Unfortunately the so-called "individual introduction" is very widespread: one or more models of new tools or equipment developed in the university are made and are used at the customer enterprise.

We see several obstacles in the path of adopting scientific research developments in production. We will call the first willy-nilly conservatism, and here is what we mean. Developments on which any NII [scientific research institute] or university is working must be introduced at a specific industrial enterprise. Meanwhile, the given enterprise has its own plan and that plan's implementation is the chief concern for the enterprise. It is a troublesome matter to be tied up with an experiment, test or finishing work. People, equipment and funds are needed. And so it happens that scientists often are greeted at enterprises with the standing phrase: "If someone else fulfilled the plan..."

The second obstacle consists of departmental barriers. Today it is already an undisputed truth that all problems must be resolved comprehensively, but this is what we have not yet learned to do.

We see the third obstacle to lie in the imperfect structure of the institutes. Now when even academic institutes have been included in resolving production problems an acute need has arisen for an improvement in their structure. Of course it is unrealistic and hardly would be advisable to set up a major design bureau and test production at every higher educational institution. Experience indicates that it is difficult going without one's own group of designers, however small, technical and economic justifiers, an information department and an experimental base with large laboratory units where it would

be possible to perform all technological processes in the initial stage, which by the way will permit a significant reduction in time periods for planning and pilot plant tests. It is truly a steeplechase.

THE SCIENTIFIC ESTABLISHMENT PERFORMING THE RESEARCH MUST HAVE AN EXPERIMENTAL PRODUCTION. The machine it makes must be tested and finished right here in the shop, and then handed over to the customer ready to use.

Some union republics already have positive experience in setting up interuniversity KB's [design bureaus] and experimental plants. This work is being done in particular in Kirghizia, Kazakhstan and Belorussia and this experience should be studied carefully and disseminated in our republic.

The national economy loses a great deal from the delay in implementing productive technical ideas. The losses have no comparison with funds needed for setting up an experimental production base.

The following circumstance draws attention: some developments such as those enumerated earlier could be used in our republic and not just outside its limits. The very same pull-type combine for pelletizing hay in the field, a milking machine for use in high-mountain areas and many other developments are fully within the capability of, for example, the experimental plant of the Armsel'khozmekhanizatsiya NPO to put out.

Higher educational institutions have more modest capabilities in comparison with the NII's. They do not have direct access to industry and it happens where university science has no opportunities to introduce its own developments. As noted in the CPSU CC and USSR Council of Ministers Decree on accelerating scientific-technical progress, they are poorly used in the national economy.

As a rule, results of university research performed under programs of the USSR State Committee for Science and Technology and under sector and republic plans find practical implementation, but today the number of such projects is less than 20 percent of the total number of those being fulfilled under university thematic plans. A majority of research results which have not been introduced are not included in these plans and it is their fate which causes concern.

Many projects are not introduced because sectors lack the necessary capacities and the material-technical, labor and financial resources for rapid reorganization of production and assimilation of new technology.

Just how can the interest of all participants in exploration be increased? The most reliable and promising way is to have cooperation of university science with sectorial institutes and with scientific-industrial associations, and through them with other industrial organizations.

Life dictates a need to set up a SPECIAL INTERDEPARTMENTAL COUNCIL in our republic, such as on agriculture, which will have to perform the role of coordinator in establishing such contact, for performing research on major problems, and for their introduction.

Naturally, not all proposals must be included in the plan. A differentiated approach to subject matter and a careful selection of the most promising developments will be required in order to avoid the unjustified dissipation of resources. This is particularly necessary now, as the Food Program has delineated the goals which can be achieved only with the reliable connection of practical work with science.

It was emphasized in Comrade Yu. V. Andropov's speech at the December 1983 CPSU CC Plenum that "much will depend on how we mobilize the collectives of enterprises, scientific research and design organizations, and engineering-technical and scientific cadres for accelerating scientific-technical progress."

This signifies a need to step up the introduction of scientific developments into the national economy. We are speaking above all about inventions, which pave the way for new tools of labor, new materials and progressive technologies which surpass the best world achievements in their indicators. The end result from the introduction of inventions is an increase in labor productivity, a rise in output, an improvement in product quality, and a saving in raw-material and fuel-energy resources.

6904
CSO: 1814/93

AUTOMATION OF PRODUCTION STRESSED

Tbilisi ZARYA VOSTOKA in Russian 2 Dec 83 p 2

[Article by Yuriy Akhvlediani, Chief of the Automated System and Computer Administration, Georgian SSR State Committee for Science and Technology: "Robots in Production"]

> [Text] The important goals set by the 26th CPSU Congress, November (1982) and June (1983) Plenums of the CPSU Central Committee included the acceleration of full mechanization and automation in all sectors of the national economy by all possible means. In this connection, it has become very important to create and use everywhere industrial robots, program-controlled automated manipulators. The development of robot technology is one of the means of the realization of the requirements set by the Resolution of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Acceleration of the Scientific and Technological Progress in the National Economy".

The prospects of the development of automated systems are determined to a considerable degree by the advances in the development of microelectronics, since the electronic component of these systems, the microprocessor, makes it possible to complicate substantially the functions performed by robots, to increase their "intellect" and to create all prerequisites for the development of automated flexible plants.

What can be expected from the wide introduction of "intellectual" robots? It is expected to have a high economic effect.

Microprocessor engineering is the link which makes it possible to combine all elements into a unified system and to switch to a complete automation in the broad sense of this word and to the development of automated flexible plants. This is the future of the development of the entire industry of our country. Such plants created on the basis of "intellectual" robot systems make it possible to produce various products without replacing its technological equipment because it is sufficient to use various control programs.

The work on the automation of production with the aid of robots started in the USSR in 1969. Since the time of their appearance to the present time, industrial robots have been used chiefly in the machine-building industry.

In the Eleventh Five-Year Plan, it is planned to introduce tens of thousands of robots all over the country which will release 100,000-120,000 workers and increase the productivity of labor by 1.5-2 times. The economic effect will be approximately equal to 0.5 billion rubles. In the Twelfth Five-Year Plan, it is envisaged to introduce widely automated systems in many sectors of the national economy. These systems are considered to be the main factor of the raising of labor productivity, improvement of the quality of production and conservation of the labor, material, technical and energy resources.

The work on the development and the use of automated systems started during the current five-year plan in our republic. In order to determine promising spheres of the use of robots and microprocessor equipment in the sectors of the national economy of Georgia, an interdepartmental council on microprocessor systems and automation was established in the Georgian SSR State Committee on Science and Technology. First-priority stages of work were determined for complete automation of processes in the electronic, instrument-making and machine-tool-manufacturing industries with a wide use of robot and microprocessor systems. Priority was given to the problems of full automation of technological processes in the tea industry in order to improve the quality of Georgian tea. A work program for the period to 1990 for the automation of the technological processes of tea production has already been developed. It provides for complete automation of the processes of the acceptance, sun-drying, fixation, rolling, fermentation and drying of tea leaves, as well as of the sorting, storage and drying of semi-finished black tea at the tea factories of the republic. The realization of this program will make it possible to automate the main technological processes of tea production and to automate almost completely many tea factories of the republic by the end of 1990.

This program provides also for the automation of the process of visual control of the production of microcircuits for the electronic industry and for the development and introduction of microprocessor facilities for metal-cutting machines with numerical program control.

The work on the automation of technological processes in the light industry has also been started in our republic. For example, a work program for the mechanization and automation of technological processes in the Gori Cotton Association is being developed. The main purpose of the program is to mechanize and automate labor-consuming manual operations at the combine in order to reduce manual labor, to improve working conditions, and to improve the quality of the products as a whole.

At the present time, studies on possible spheres of the use of automated systems and microprocessor equipment in other sectors of the national economy of the republic are also continued. Further development of full automation and mechanization of technological processes poses the problem of a wide introduction of series-produced automated systems, as well as the development of these systems for sectors and enterprises of the republic's national economy. The solution of the problem of radical technical reequipment of our industries through the introduction of "intellectual" robots requires concentrated efforts of scientists and specialists and brings up the problem of personnel training, particularly, the training of students in the republic's vuzes in the area "Robots and Automated Systems". All these problems must be reflected in the republican integrated scientific and technical program for the problems of the utilization of automation at the enterprises of the national economy of the republic.

The November (1982) and June (1983) Plenums of the CPSU Central Committee proposed a clear program for bringing our industry up to the best world standards with respect to its effectiveness, quality and competitiveness. Science and technology and, particularly, automation open up broad possibilities in this respect.

10,233
CSO: 1814/81

TESTING CENTER FOR SUPERCONDUCTOR AND CRYOGENIC EQUIPMENT TO BE BUILT

Moscow MOSKOVSKAYA PRAVDA in Russian 13 Jan 84 p 3

[Article by B. Dimov: "Foundation of 'Interpoligon'"]

[Text] According to the city developers, this complex will become a distinctive feature of the region. The building of the international experimental center of the CEMA member countries for testing superconductor and cryogenic equipment will be located in the Nagatinskaya Water Meadow within a triangle formed by Proletarskiy Prospekt, an open line of the metro of the Gor'kiy-Zamoskvoretsk radius at the "Avtozavodskaya"-"Kolomenskaya" line and the water surface of the pond created in the old channel of the Moscow River. As we were informed at the Main Administration of Archetectural Planning, its construction will start in 1984.

"Interpoligon" is created by joint efforts of five CEMA member countries, People's Republic of Bulgaria, Polish People's Republic, USSR, Socialist Republic of Romania and Czechoslovakian Socialist Republic, which concluded a scientific agreement in 1976 on joint work on the creation and introduction of a new generation of power equipment based on the use of the phenomenon of superconductivity.

The following was told by Professor Yuriy Nikolayevich Vershinin, director of the State Scientific Research Power Institute imeni G. M. Krzhizhanovskiy:

In order to practically use this phenomenon, it is necessary to solve complex problems and to conduct fundamental studies in the area of thermodynamics, thermophysics and metallurgy. All this required joint efforts of large scientific teams. At that time there appeared the idea of coordination of scientific studies and design projects in this area among socialist countries.

One of the most important directions in the cooperation on this problem was the creation of "Interpoligon", a powerful experimental center which had to have all conditions for the most rapid and effective solution of scientific and technical problems connected with low temperatures and superconductivity.

The Institute imeni G. M. Krzhizhanovskiy, which is a scientific "director" of the "Interpoligon", conducts all work on its creation in close cooperation with all most authoritative organizations in this area both in our country and in Socialist countries.

The partner countries have their own interests which they hope to realize with the aid of "Interpoligon". For example, Czechoslovakia is most interested in the work on superconductive electrical machines and on devices for magnetic separation of kaolin, which is the main raw material of the porcelain industry. Poland specializes in the problem of the development of insulating materials for cryogenic devices. Of course, there is no doubt that unique technical potentialities of "Interpoligon" will also attract other countries which are not yet participating in the cooperation on this problem.

Yu. N. Vershinin said: "I would like to point out one important characteristic of this project. 'Interpoligon' was conceived and is being designed not only for this age but also for the following age. Being built at the end of the 1980s, it must justify the expenses invested in it during subsequent decades. This means that by founding our 'Interpoligon' we are laying the foundation for the technology of the twenty-first century."

10,233
CSO: 1814/81

ACADEMICIAN DISCUSSES PROBLEMS FACING SCIENCE TODAY

Kiev RADYANS'KA UKRAYINA in Ukrainian 16 Oct 83 p 2

[Article, published under the heading "Thoughts of a Scientist," by UkSSR Academy of Sciences Academician V. Utkin: "Who Will Come Into Science"]

[Text] Tomorrow is the 60th birthday of Ukrainian SSR Academy of Sciences Academician V. F. Utkin, a famed scientist in the field of mechanics, twice Hero of Socialist Labor, and recipient of the Lenin Prize and USSR State Prize. The range of his scientific interests is extraordinarily broad. A characteristic feature of the creative activity of V. F. Utkin is a constant endeavor to utilize advances in the basic sciences to the greatest extent possible in daily practical activities.

Volodymyr Fedorovych devotes a great deal of time and effort to the development of young scientists. His pupils include a large number of talented engineers, candidates and doctors of sciences. The following article by this scientist, which RADYANS'KA UKRAYINA offers to our readers, deals with problems of training the next generation of scientists and contains reflections on the paths which lead to the top echelons of science, to the summits of knowledge.

The world of science is marvelous and unique. I don't know what can give a person greater pleasure than scientific creativity, the age-old quest for new solutions, new knowledge, new hypotheses, ideas, and discoveries. But how can one enter this world? What roads lead into it? The easiest thing would be to answer as follows: in order to become a scientist, talent is necessary. Who will argue against this statement? I am convinced that nobody will.

But other questions arise at this point: where should one look for young scientific talents? How should they be developed? And finally, how should they be brought onto the path of independent creative research? These questions are both complex and difficult. But they cannot be ignored today, or resolved hastily, without pause. Nor can they be put off "until later." Here are just two observations. At one time, more precisely in the 1960's, we were witness to strong competition for enrollment in higher technical schools and natural sciences faculties. But for a number of years now we have

been observing the opposite -- there is almost no competition for enrollment in those same institutes, for those same areas of specialization. Here is another fact. At a recent session of the General Meeting of the UkSSR Academy of Sciences it was noted with alarm that in the last 10 years the average age of department heads at the institutes of the republic academy has risen by 4 years, and now is averaging 53 years. Almost one tenth of staff personnel are of pension age or are advanced in years.

I believe that the connection between both these facts is obvious. And there is no doubt that one should focus the most serious attention on training the next generation of scientists and encourage young, creative talents to enter science.

And I am deeply convinced that it is necessary to begin the search for young talents right out of secondary school. The June (1983) CPSU Central Committee Plenum, which I attended, stressed the necessity of giving serious thought to a Soviet school reform. I believe that this matter has been brought up in a very timely manner. I feel, for example, that the secondary school today must take into consideration the demands of scientific and technological advance, demands which are constantly changing, and in the direction of increasing complexity. It is hardly advisable, for example, to load down students with a large quantity of information, as is presently being done. The years in secondary school should give a student not only a certain sum total of knowledge, but first and foremost should teach him to think creatively and to work independently.

I would particularly note here the role of the secondary school teacher. A very great deal depends on his ability to reveal the capabilities of his pupils, precisely and accurately to guide their creative abilities and interests. As I write these words I recall my secondary-school mathematics teacher, Vasyl' Fedorych Ol'kin. He was a person who had a mastery of the secret of instilling a love of what he had to teach, of what would seem to be such a "dry" subject as mathematics! A spirit of creativity, a spirit of competition reigned in his classroom. It was not enough to solve a problem. How could it be solved by another method? And are there still other methods of solving it? Mathematics classes were very popular with us students at Lashma Secondary School, in Rivne Oblast.

Since that time I have had a lifelong love affair with mathematics. Upon returning from the war, I enrolled at the Leningrad Institute of Mechanics. And although there was a long interval, the five years of the war, between high school and college, I was able to catch up fairly rapidly and not to fall behind those who had entered college immediately after high school. The knowledge and skills which my mathematics teacher and my other teachers had so wisely helped me to acquire proved to be strong and reliable.

It has long since been noted that the respect earned by a secondary-school teacher is often in determining significance in some students' choice of occupation and career. One must have the ability to earn and maintain that respect. I believe, however, that today secondary-school teachers and faculties need greater and more active support. It is not only a matter of pedagogical

of how to help accomplish repairs on a classroom or donate a machine tool to a school shop (although this is also needed). What I have in mind is something else. Scientists have little time at their disposal. Neverthless we must take advantage of the slightest opportunity to visit patron-designated schools from time to time and to get together with teachers and pupils. We have some fine examples of such get-togethers. So-called Little Academies of Sciences, which are patronaged by leading scientists of a number of republic academy institutes, have been operating successfully for years now in Kiev and the Crimea. There could be more such examples, however. Scientists should also more frequently attend school olympiads, which I consider to be a highly effective form of involving high-school students in the world of scientific and technological quest. In short, the reliability of the bridges of friendship between institutes and secondary schools determines in large measure how many people will pass across these bridges into the institute laboratories and offices.

College is the next domain in which there are opportunities to search for and discover young talents. I believe that these opportunities as well are not being fully utilized. I shall mention only a few items. I am firmly convinced that, in addition to mandatory assimilation of theoretical knowledge, during his years of study a student should be called upon, while still in college, to think about and gradually to prepare himself for a future practical career. But how often does this happen? You ask a young person graduating from college what he plans to do in the future and where he will take employment, and he will merely shrug his shoulders in reply: "I don't know. I'll go wherever they send me."

I repeat: students, of course primarily upperclassmen, should think about what they should do after graduation, and they should more broadly and deeply study those subjects which will be useful to them in the future. At the same time we also, members of the older generation, are called upon to help them make this choice. We should be able to find the proper words and the proper approach so that a young person would believe us and choose that profession which is most in conformity with his ability. If a student shows a proclivity toward scientific research, he should be guided toward deeper study of an appropriate branch of science. If he has designer abilities and the desire to become a designer, it would be worthwhile to involve him in design activities. How do I discover such a proclivity? A student who is a future design engineer should be able to design individual assemblies by the fourth year of college. These can be not abstract but quite specific design problems, such as industrial enterprise orders. When I was a student we solved financial problems for the most part by means of physical labor, as a rule on the loading docks. Today students have the opportunity to receive money in addition to their stipend, by taking part in contract work undertaken by the scientific research sectors of higher educational institutions and in working on department applied research topics. All that is needed is desire, and interesting, useful and, in addition, quite necessary design and research work can be found. I am against leaving a student on his own with the problem of choosing a future career area. During this difficult time of determining a future career, a person needs tactful and unimportunate support and help from his older comrades -- college instructors, and scientists who have contacts with higher educational institutions.

A few words about such contacts. I am strongly convinced that higher educational institutions and the scientific establishments to which their graduates are job-assigned should work in close cooperation with one another. It is necessary that while they are still in school students should be able to acquaint themselves with their future place of employment, with its character, and with the workforce which they will be joining. This is very important, for it eliminates the need for the young specialist to become acclimated, a process which drags on quite some time and slows the creative growth of the newcomer. An excellent example is offered by the UkSSR Academy of Sciences Institute of Electric Welding imeni Ye. O. Paton, which for decades now has been fruitfully cooperating with Kiev Polytechnic Institute. Incidentally, the director of the Institute of Electric Welding, Academician B. Ye. Paton, is a graduate of this higher educational institution. Recently the people at the institute have found an additional channel for adding gifted young people to their staff: departments of the Moscow Physical-Technical Institute have been established at facilities of the institute and a number of other Kiev establishments, with the graduates channeled into the UkSSR Academy of Sciences system.

Incidentally, I feel that it can only be beneficial if a given serious scientific establishment hires the graduates not of one but of three or four higher educational institutions. This makes it possible to select people from different scientific schools, different fields of knowledge, and to do a better job of specializing them. Unfortunately this cannot always be achieved. And the problem is housing. I believe that it would be a good thing if in certain cases officials at scientific establishments were enabled to make a free selection of young specialists among graduates not of one but of several higher educational institutions.

And finally, a third domain in which scientific talents can and should be noticed and developed. I am talking about the workforces which the college graduates join. As we know, collective creativity predominates in today's science. The times of the scientists working alone are irrevocably a thing of the past. Under these conditions is it possible to take notice of a capable young scientist and to prevent him from becoming lost in the crowd? It is possible, but only if we work with young specialists in a proper, informal way. A great deal can be gained from creative competition among young people, especially regular conduct of competitions and scientific conferences. They have become a standard occurrence in our workforce and in many others. Leading scientists take part in their conduct, thus ensuring extensive publicity. For more than one young scientist the road to recognition and to a high position in science began precisely with participation in competitions and conferences.

In addition to such collective forms of seeking out young talents, it is very important to work individually with young scientists. Here also I would place particular emphasis on the exceptional importance of the role of scientist-mentors. Just as the teacher in school, the experienced scientist at the scientific establishment is called upon to concern himself constantly with the discovery and development of the abilities of his pupils. Perhaps I would not touch upon this subject if everything were going well with mentorship in science. But we must be concerned by the fact that in certain institutes the

intensity of search is dropping off, the level of scientific quest is diminishing, and certain promising areas of investigation are shutting down due to a lack of new ideas and new young research talent. This means that those in charge of scientific staff and veteran scientists have failed to show concern in a prompt and timely manner for securing and training the next generation.

It is my opinion that every scientist is outright obligated to be concerned with his associates and successors in science. Fame has been brought to many great scientists not only by their outstanding discoveries but also the scientific schools which they established. Who, for example, is not familiar with the school of Academician A. F. Ioffe, which produced academicians I. V. Kurchatov, A. P. Aleksandrov, and a group of Kharkov scientists, who in turn established their own schools and pioneered new areas of scientific investigation and even entire branches of modern science. Today the schools of academicians O. K. Antonov, Yu. O. Mitropol'skiy, O. S. Davydov, and many other of this republic's scientists are known far beyond the boundaries of the Ukraine and this country.

Thus we have an example to follow. This example shows that the relay baton of knowledge and experience is passed on via scientific schools, via patronship by scientists of the older generation. The advance and development of science is inconceivable and impossible without this passing-on process. There is a wise saying: "Teacher, teach your pupil, so that later there will be someone from whom to learn!"

The world of scientific creativity is a special world. The road into this world is no bed of roses. This fact also should not be kept from young people who are preparing to take this road. At the same time, however, we should reveal to them the uniqueness and fascination of the scientific quest which is being conducted for new knowledge and which expands the horizons of progress for mankind. And we should not only reveal this to young people but we should help them as well, support them on the thorny road to the summit of science.

3024
CSO: 1811/20

ACTIVITIES OF THE STATE PUBLIC SCIENTIFIC AND TECHNICAL LIBRARY DESCRIBED

Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 83 p 15

[Article by I. Kharina, director of the USSR State Public Scientific and Technical Library: "The Largest Information Center"]

[Text] The USSR State Public Scientific and Technical Library marked its twenty-fifth anniversary in October 1983. It is the main scientific and technical library of the country which has a unique seven million volume collection of domestic and foreign literature on physics, chemistry, mathematics and other fundamental sciences, in all areas of technology, on economics, and industry. It is used by more than 190,000 people. Its book holdings are used widely by specialists not only of Moscow, but also of other cities of the Soviet Union. The library receives more than 300,000 requests for literature. It has copying and duplicating machines for the use of the readers.

The library gives its special attention to information services for special-purpose integrated scientific and technical programs. As a rule, they determine not only the topics of book exhibits but also all main mass measures for the popularization of scientific and technical literature.

In the series "Aids for the Development and Realization of Special-Purpose Integrated Scientific and Technical Programs", the library started publishing topical bibliographical indexes. The three published indexes deal with the protection of water sources and the air, and wasteless technology. These publications include more than 1000 bibliographical items of the latest domestic and foreign literature published in the last three years.

In the same series, the following indexes were published for specialists in computing machinery: "Program-Controlled Automatic Manipulator (Industrial Robot)" and "Uses of Minicomputers and Microcomputers for Automated Control of Technological Processes and Equipment", "Algorithms and Programs". This is a monthly edition which reflects all current acquisitions of the USSR GPNTB [State Public Scientific and Technical Library].

A specialized reading room was organized for physicomathematical literature, algorithms and programs.

The library staff is working on further improvement of the services to the readers and their information and bibliographical activities.

10,233
CSO: 1814/82

END

END OF FICHE DATE FILMED

27 APRIL 1984